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A RECORD OF
CONTRIBUTIONS
FROM THE
NATIONAL HERBARIUM
UNION OF SOUTH AFRICA
PRETORIA

Smithsonian Institution
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SEP 19 1924
National Museum

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PREFACE.

WITH the advent of Union and the ever-increasing demands made by the public for information regarding the vegetable resources of the country, its plant poisons, and plant pests, considerable stimulus has been given to botanical research in South Africa.

One of the results of the progress made has been the establishment of the National Herbarium at Pretoria under the Department of Agriculture.

The National Herbarium now embraces all the more important private collections in the country, including those of Mr. E. E. Galpin, the late Mr. H. G. Flanagan, Madame A. Dieterlen's Basutoland herbarium, Miss A. Pegler's Kentani plants, Madame J. Borle's collections from Portuguese East Africa, and Mr. E. G. Bryant's plants from the Prieska and Hay Districts.

It also possesses the largest collection of South African fungi in existence, amongst which may be mentioned a large number of specimens of the superficial ascomycetes affecting our forest trees, and the original collections of Dr. Medley Wood, including a number of type specimens, while to it have been bequeathed the valuable cryptogamic collections of Dr. T. R. Sim ; Tyson's collections of marine algae, including his private herbarium, have also been acquired by purchase.

A vast amount of material has thus been accumulated, and the special work which has been done on it in the past few years makes it very necessary and desirable that it should be published and made available to workers in other parts of the country. Consequently it has been decided to issue from time to time as occasion demands a publication which will consist of contributions from the National Herbarium.

In view of the great agricultural development which has taken place in South Africa since Union, and bearing in mind that much of this was due to the policy and influence of the first Union Premier and Minister for Agriculture—the late General Botha—no more fitting name for the official organ of the National Herbarium could be found than that of

"BOTHALIA."

Bothalia is intended primarily as the medium for the publication of papers and monographs based on the material in the National Herbarium, presenting new facts and items of general interest.

It will include descriptions of new or little known plants, cryptogamic and phanerogamic, and it is hoped will mark a further step in the progress of botanical science in South Africa.

I. B. POLE EVANS.

Pretoria,
1st January, 1921.

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Smithsonian Institution
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SOUTH AFRICAN ASCOMYCETES

IN THE

NATIONAL HERBARIUM.

By ETHEL M. DOIDGE, M.A., D.Sc., F.L.S., Assistant Chief, Division of Botany and Plant Pathology.

PART I.

MOST of the South African fungi described in the early days were collected by MacOwan, Medley Wood, and others, who made a practice of sending a part of their material to Europe for determination and retaining the duplicates; many of these duplicates are now incorporated in the National Herbarium. These specimens are not strictly co-types, as they were not examined by the describers of the species, but since the specimens were all numbered, one rarely finds that they are not identical with the type specimens bearing the same numbers. The same applies to specimens sent to Sydow in more recent years, descriptions of which were published in the "Annales Mycologici."

Many alterations in nomenclature and classification have been introduced of late years, chiefly by V. Höhnel, Theissen, and Sydow, who have published revised descriptions from the type specimens. In some cases it is possible to add a few details to these descriptions from more abundant and more recent collections, and to record the fungus on other hosts and from new localities.

There are also a number of ascomycetes in the Herbarium which have been previously recorded from other parts of the world, or which are apparently undescribed.

In every case the numbers quoted in square brackets are those of the mycological section of the National Herbarium.

I am indebted to Mr. W. E. Schilz for the preparation of a fine series of sections of the fungi under consideration and for considerable assistance in the translation of some of the descriptions from the original German.

1. **Schneepia radiata** Doidge.

Syn. *Lembosia radiata* Doidge (South African Microthyriaceae, Trans. Roy. Soc. South Africa, VIII, Part 4, 1920).

On leaves of undetermined shrub (Leguminosae) Rikatli, Portuguese East Africa, Junod [11729].

This fungus was originally described as a *Lembosia*, but by studying sections through the leaf of the host an intramatrical hypostroma may be detected. This consists of a colourless hyphal mass lying between the cuticle and the epidermis, and sometimes penetrating downwards into the epidermal cells. In certain of the epidermal cells compact balls of dark coloured hyphae are formed, and at these points the fungus breaks through the cuticle to form the ascostroma.

The ascostroma is attached at several points and is almost 40 μ high; the hypothecium is thin and colourless.

The intramatrical hypostroma with superficial ascomata is typical of the *Polystomellaceae ;* the radial arrangement of the loculi which are attached at several points, the paraphysate asci, and two-celled brown spores are characteristic of the genus *Schneepia*, to which this fungus must therefore be referred.

2. **Cycloschizon brachylaenae** (Rehm), P. Henn.

Engl. Bot. Jahrb. XXXIII, p. 39 (1902) ; Syll. Fung. XVII, p. 896.

Syn. *Schneepia brachylaenae* Rehm, Hedwigia 1901, p. 173.

On living leaves *Brachylaena neriifolia*, Bains Kloof, near Wellington, C.P., 12.11.10, Doidge [981].

On *Brachylaena dentata*, Port Elizabeth, West [761] ; Van Stadens Pass, 9.3.16, Bottomley [9562] ; Van Stadens Pass, 17.5.18, Pole Evans [11445].

On *Brachylaena discolor*, Lemana, Zoutpansberg District, 14.8.11, Doidge [1789] ; Duikerfontein, Natal, 10.10.11. Moon [1887] ; Port Shepstone, Natal, 15.10.12, Pole Evans [5605] ; Umgeni, near Durban, 15.11.16, V. d. Bijl [10088].

On *Brachylaena elliptica*, East London, 24.11.17, Doidge [10912].

On *Brachylaena* sp., Rikatli, Portuguese East Africa, September, 1918, Junod [11724].

Sydow [Ann. Myc. XIII (1915), p. 207], described this fungus in detail from the type specimen (Exsicc. Rabh. P., F. Eur. et extra-europ., 4264), which agrees in every respect with the material in the National Herbarium. The original is evidently not quite mature, and in this connection Theissen and Sydow writes as follows :—" Die Art unterscheidet sich generisch nur durch die farblosen Sporen von *Dielsiella :* da die Asken des Originals noch nicht ganz ausgereift sind, wäre es nach diesem Exemplar nicht ausgeschlossen, dass die Sporen sich später braünten ; dan fiele die Gattung *Cycloschizon* mit *Dielsiella* (1903) zusammen und letztere müsste gestrichen werden. Zu demselben Ergebnis kam V. Höhnel (Fragm. n. 634 und 635). . . . Das oben erwähnte Exemplar auf *B. dentata* scheint jedoch völlig ausgereift zu sein. Wir fandan hier schon ausserhalb der Schläuche zahlreiche, stets völlig hyaline Sporen, Wahrscheinlich stellt *Cycloschizon* daher eine gute Gattung dar."

After examining the abundant material detailed above, it is evident that the spores of *Cycloschizon brachylaenae* become fuscous, and later brown, at maturity. The genus *Dielsiella* is therefore identical with *Cycloschizon* and the species *Dielsiella pritzelii* P. Henn., and *D. alyxiae* (Mass) Th. and Syd. become *Cycloschizon pritzelii* (P. Henn.) and *C. alyxiæ* (Mass), respectively.

An apparently undescribed species on *Catha edulis* also belongs to the genus *Cycloschizon*, and is described below.

3. **Cycloschizon fimbriatum** n. sp.

On living leaves of *Catha edulis*, Letaba Drift, Zoutpansberg District, 6.8.11, Doidge [1798] and [1833] ; Rikatli, Portuguese East Africa, 31.5.18, Junod [11682] ; Louis Trichardt, 8.4.19, Putterill [11835].

Stromata amphigenous, scattered, circular, 1·5 to 2 mm. diam., surface dull black, crustaceous, with an irregular annular ridge marking the position of the loculi ; attached to the leaf by a massive central foot, which is black and pseudo-cellular, arising from a dense hypostroma. The hypostroma consists of closely interwoven and packed hyphae, which completely destroy the palisade cells or the mesophyll cells in the immediate vicinity of the foot and penetrate right through the thickness of the leaf in the intercellular spaces. The increasing pressure of the hypostroma ruptures the epidermis, and at this point the foot is formed.

Except for the central foot, the stroma lies free on the leaf surface. The outer membrane is radial in structure, rather loosely interwoven, and composed of hyphae 3·5–4 μ thick. At the periphery it spreads out into a short fringe of brown, radiating hyphae about 3·5 μ thick ; these are undulating, branched, and sometimes more or less coherent. The central portion of the stroma is sterile, the loculi being arranged in a circle round the centre; loculi linear, about 270 μ wide and 100–115 μ high, dehiscing by a longitudinal fissure. Hypothecium pseudo-cellular, rather pale.

Asci paraphysate; ovate when immature, thick walled above, 60 μ × 30–33 μ, and with irregularly tristichous or conglobate spores. Mature asci clavate or ellipsoid, 75–90 μ × 23–26 μ with distichous spores. Asci stain brick red with iodine; there is no blue reaction.

Paraphyses numerous, hyaline, linear, about 2·5 μ thick. Spores brown, opaque at maturity, two-celled, slightly constricted, ellipsoid, cells equal or sub-equal, 28–30 μ × 12–13·5 μ.

Cycloschizon fimbriatum Doidge, n. sp.

Stromata amphigena, sparsa, 1·5–2 mm. diam., superficialia, centro affixa; centro sterili magno 400–500 μ diam.; irregulariter radiatim ex hyphis septatis 3·5–4 μ crassis brunneis composita, ambitu hyphis longiusculis radiantibus, 3·5 μ crassis, flexuosis, ramosis cincta; loculo annulari integro v. interrupto, 270 μ lato, 100–115 μ alto, rima longitudinale aperto. Asci paraphysati, clavati v. ellipsoidei, 75–90 μ × 23–26 μ, octospori, paraphysibus numerosis, hyalinis, linearibus, 2·5 μ crassis. Sporae brunneae, oblongae, medio vel paullo supra medium septatae, leniter constrictae, ad apicem rotundatae, 28–30 μ × 12–13·5 μ.

Hab. in foliis *Cathae edulis*, Zoutpansberg Dist., Transvaal, 6.8.11, leg. Doidge [1797].

4. **Cocconia porrigo** (Cke.) Sacc.

Syll. Fung. VIII, p. 738.

Syn. *Rhytisma porrigo* Cke., Grevillea X, p. 129 (1882).

On leaves of *Olea capensis*, Inanda, August, 1881, Wood No. 660 [10702]; Van Stadens Pass, C.P., 13.11.17, Doidge [10888].

Stromata amphigenous, but mostly epiphyllous, not crowded, round, flat, dull black, up to 5 mm. diameter; central portion raised and rugose, 120–140 μ thick. In the smaller stromata there is a regular circular loculus forming a ring round the centre, and within it a second smaller loculus which may be circular, S-shaped, or irregular. In the larger stromata there are several concentric, circular loculi. At the periphery the covering membrane is thin and membranaceous with lobed margins, and consists of radiating, brown, septate hyphae which are 4–4·5 μ thick. Hypostroma extensive, in and under the epidermis, dark, breaking out at many points and spreading horizontally on the cuticle; thus it forms a layer of short, septate hyphae about 26–30 μ thick, which becomes gradually thinner towards the periphery. Covering membrane radial in structure, carbonaceous, 30–40 μ thick. Height of stroma 140–160 μ. Asci broadly ellipsoid, 80–85 μ × 27–30 μ with distichous or tristichous spores. Paraphyses filiform. Spores dark brown, 30–33 μ × 11–13 μ, two-celled, constricted; loculi unequal, upper cell about 14–16 μ × 13 μ, broader and shorter than the lower cell, which is 16–18 μ × 11 μ.

5. **Cocconia concentrica** Syd.

Ann. Myc. XIII (1915), p. 215.

Syn. *Hysterostomella concentrica* Syd. Ann. Myc. VII (1909), p. 544; Syll. Fung. XXII, p. 556.

Hysterostomella circularis, Har. et Pat. Bull. Mus. Hist. Nat., 1911, p. 368.

On *Trichilia emetica*, Lourenço Marques, 24.9.08, T. R. Sim [508]; Umbelusi R. Portuguese East Africa, 9.11.10, Howard [1019]; Rikatli, P.E.A., September, 1918 Junod [11728].

This fungus has only been recorded from East Africa on *Trichilia emetica*.

It has been described by Sydow (*loc. cit.*) as follows:—On the upper side of the leaf there appear numerous concentric rings of small, black, punctiform bodies, which gradually develop into small round discs. These form the central part of the stroma, and they later coalesce, forming stouter linear stromata which still show the original ring formation. Meanwhile the concentric ring formation continues at the periphery. The mature stroma is crustaceous in the centre, the original disc-like bodies having become confluent radially as well as laterally, but the concentric circles are still evident; the outer circles still comprise discrete, round, immature discs. The separate stromata vary considerably in length.

A transverse section through a collective stroma, which also passes through single stromata, shows a chain of fruiting bodies with central attachment, and with a sterile central portion.

The single stromata are thus attached to the leaf by their long axis, lying free on both sides of the keel formed by the line of attachment. They are 320–420 μ high. Beneath the sterile central portion the hypostroma fills the epidermal cells of the host in an area extending 100–120 μ in diameter. The hypostroma is not continuous, but more or less interrupted; and it produces numberless fine brown hyphae which pierce the cuticle and appear on the surface as a compact stroma. Asci club-shaped cylindrical, thick-walled round the apex, very briefly pedicellate, 45–55 μ × 14–18 μ, eight-spored. Spores distichous, elongated, rounded at both ends, two-celled, brown, 14–18 μ × 4–5 μ. Paraphyses filiform exceeding the asci in length, united above, and forming a somewhat coloured epithecium.

6. **Cocconia capensis** n. sp.

On leaves of *Ochna arborea*, Howiesons Poort, near Grahamstown, 12.7.19, Doidge [12373].

Stromata epiphyllous, round, dull black, minute, up to 1·5 mm. diam., in appearance rather like a scale insect, centre raised, 130–150 μ high, margin flat, appressed to leaf surface; centre sterile, surrounded by a single circular loculus, 240–270 μ broad; covering membrane black, opaque, about 13 μ thick over the loculus, at the edge becoming somewhat lobed, thin, flat, and light coloured, consisting of fuscous, radiating hyphae, 3–3·5 μ thick.

Hypostroma very well developed, penetrating right through the leaf and forming a tangled weft of hyphae in the intercellular spaces. At certain points the hypostroma becomes much thickened in the epidermal and subepidermal cells, and the hyphal mass becomes dark coloured and cellular, the cells being 6–7 μ diam.

It breaks through the cuticle and forms a short column of elongated cells, certain of which spread out radially on the leaf surface to form the hypothecium, and others growing to a higher level form the central sterile portion of the stroma, and give rise laterally to the covering membrane. The hypothecium is brown, 30–36 μ thick and similar in texture to the hypostroma, but the cells are flattened and elongated in a radial direction. There are numerous secondary points of attachment along the axis of the loculus.

Asci clavate, eight-spored, pedicellate, thickened round apex, paraphysate, 65–70 μ × 22–25 μ, they do not react to iodine; paraphyses numerous, filiform. Spores two-celled, brown, 21–23·5 μ × 9–10 μ, slightly constricted; in immature spores the cells are markedly different in form, they are equal in length, but the upper loculus is spherical, 9 μ diam., and the lower clavate, tapering from 7 μ at the centre to 4 μ at the tip. In mature spores the difference is less marked.

Cocconia capensis Doidge nov. sp.

Stromata epiphylla, sparsa, rotundata, atra, minuta usque 1·5 mm. diam., 130–150 μ alta, pluries affixa, radiato ex hyphis 3–3·5 μ cr. contexta; loculo unico annulari, 240–270 μ lato, hypostromate epidermali et sub-epidermali oriunda. Hypothecium brunneolum 30–36 μ cr. Asci clavati, paraphysati, octospori, pedicellati, ad apicem incrassati, 65–70 μ × 22–25 μ; paraphysibus numerosis filiformis. Sporae brunneae, sub-clavatae, 1-septatae, constrictae, 21–23·5 μ × 9–10 μ, loculo supero latiore.

Hab. in foliis *Ochnae arboreae*, Howiesons Poort, 12.7.19, leg. Doidge [12373].

7. **Hysterostomina tenella** Syd.

Ann. Myc. XIII (1915), p. 228.

Syn. *Hysterostomella tenella* Syd. Ann. Myc. X (1912), p. 442.

On *Asparagus striatus*, Despatch, near Uitenhage, 23.3.11, Doidge [1241].
On *Asparagus* sp., Kentani, 19.3.12, Pegler [2240]; 3.6.12, Pegler [2362].

Stroma flat, membranous, dull black, 2–10 mm. long, irregular in shape, 70–80 μ high, on both sides of the leaf, or more or less clothing the stem. Loculi very closely crowded, irregularly arranged, dehiscing by a longitudinal slit; covering membrane radial, dark brown to black, opaque, formed of hyphae 3–4 μ thick. Hypothecium very thin, light brown. Asci paraphysate eight-spored, at first broad, oval, with conglobate spores; later becoming elongated, with distichous spores; very thick walled at the upper end, 45–60μ × 16–20 μ. They do not react to iodine. Spores dark brown, strongly constricted, cells spherical, sub-equal, elliptic-oblong, rounded at the ends, 13–16 μ × 6–8 μ. Hypostroma not well developed; it can only be detected in the stomata in the form of pegs, 20–25 μ high and 14–16 μ thick, which do not penetrate into the intercellular spaces.

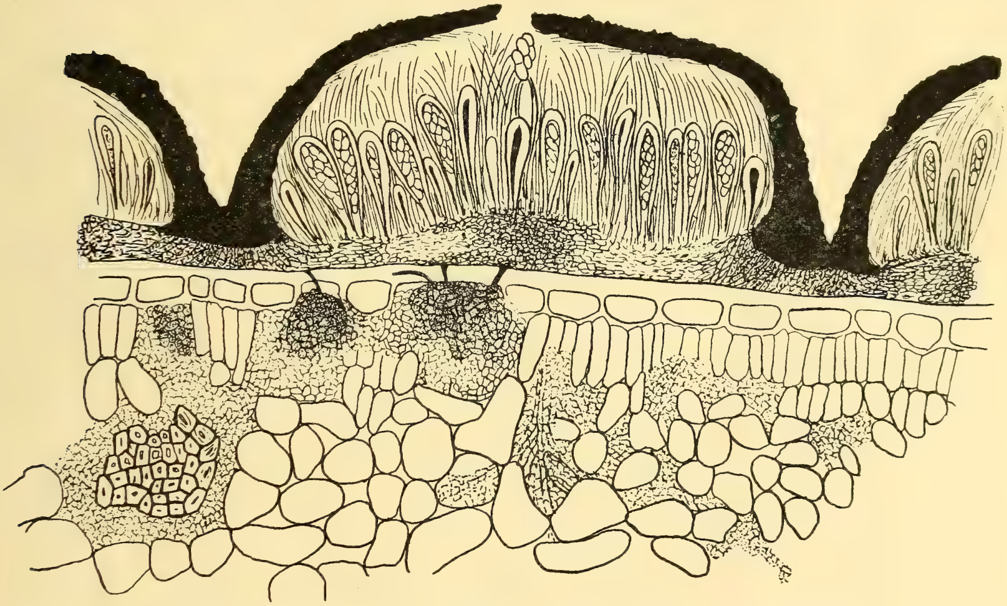

Fig. 1.—Section through loculus of *Macowaniella congesta*, showing hypostroma.

8. **MacOwaniella** Doidge, nov. gen. *Polystomellacearum.*

Stromata superficialia, radiato-contexta ex hypostromati epidermali et sub-epidermal oriunda; loculis linearibus, rectis v. curvulis, inordinate nidulantibus. Asci paraphysati octospori. Sporae phaeodidymae. Mycelium superficiale ramosum, septatum.

This genus differs from *Hysterostomina* in the presence of free mycelium, and from *Lembosiodothis* in the absence of sub-cuticular bands. The hypostroma is deep-seated in the tissues and is not sub-cuticular.

MacOwaniella congesta (Wint.), Doidge.

Syn. *Lembosia congesta* Wint., Syll. Fung. IX, p. 1105 [Wint. Exot. Pilze in Flora, 1884, p. 9].

On leaves and stems of *Carissa arduina*, Lemana, Zoutpansberg, 14.8.11, Doidge [1786]; Isipingo Beach, Natal, 21.5.17, Doidge [10155]; Cango Valley, Oudtshoorn

Dist., 9.11.17, Doidge [10898]; Woodville Forest, George, 11.11.17, Doidge [10929]; Howiesons Poort, Grahamstown, 17.11.17, Doidge [10960]; Lovedale, Alice, 18.11.17, Doidge [10979]; Hoggs Back, C.P., 15.1.18, J. and M. Henderson [11345]; Grahamstown, 1917 [11369].

On *Carissa grandiflora*, Isipingo, Natal, 27.3.18, Bottomley [11380]; Krantzkloof, Natal, 26.5.15, Doidge [8983].

On *Carissa acuminata*, Stella Bush, Durban, 7.4.18, Bottomley [11381].

This fungus was originally described by Winter from material collected by MacOwan.

In his "Lembosia-studien" [Ann. Myc. XI (1913), p. 457], Theissen mentions this species, and dismisses it with a single sentence: "Der Beschreibung Winter's ist nur hinzuzufügen, dass die an hyalinen Hyphenbüschel enstehenden Konidien sichelförmig sind, einzellig, beid endig spitz, farblos, 20 μ × 2 μ." However, he omits it from his synopsis of species, and from this one would gather that he was doubtful about its systematic position.

The fungus on *Carissa arduina* is very common throughout the country, and with the abundant material at my disposal I have made a careful study of sections through the host, and find that it has a very abundant and well-developed hypostroma. It must therefore be placed in the Polystomellaceae. It differs from *Hysterostomina* in the presence of fairly well-developed superficial mycelium. I have therefore made it the type of a new genus *MacOwaniella*.

MacOwaniella congesta occurs on the younger branches of *Carissa* spp., less frequently on the leaves. Stromata, superficial, round or elliptic or irregular in shape up to 4 mm. diameter; loculi linear, straight, curved, or flexuous, closely crowded, irregularly arranged, 500–800 μ long and 180–220 μ broad; less frequently oval, attenuated towards both ends, 280–340 μ × 160–175 μ; rarely almost circular, 160–190 μ diam., 120–140 μ high, dehiscing by a longitudinal slit. Hypothecium pseudo-cellular, colourless or light brown in centre, consisting of thin-walled plectenchyma. Covering membrane radial in structure.

Hypostroma strongly developed, penetrating deep into the tissues, forming closely packed masses of interwoven hyphae in the intercellular spaces and in the cells. These are especially evident in the epidermal and sub-epidermal cells under the fruiting bodies, where at intervals the hyphal mass becomes thick walled and dark brown to black in colour, and is connected with the ascostroma by slender, brown to black, fungous pegs about 6 μ thick, which pierce the cuticle. At or near the point where the cuticle is pierced the dark hyphae often penetrate laterally into the cuticle for a short distance.

Asci oblong to clavate, attenuated into a short foot, eight-spored, paraphysate, 60–70 μ × 21–26 μ. Paraphyses filiform, often forked at the apex, tips more or less conglutinate. Spores conglobate or sub-distichous, oblong, 1-septate, constricted, fuscous when mature, 17–18 μ × 7–9 μ.

Mycelium on the leaves well developed, fuscous, undulating, abundantly branched, and anastomosing, with a few sessile, dark brown, hemispherical hyphopodia, 6·5–8 μ × 6·5 μ on the primary hyphae; mycelium on the branches not so well developed, hyphae straighter, more slender, 3·5–5 μ thick, branches parallel, with occasional elongated reticulations.

9. **Asterodothis solaris** (K. and Cke.) Theiss.

Ann. Myc. X (1912), p. 179; Ann. Myc. XIII (1915), p. 232.

Syn. *Asterina solaris* K. and Cke., Grevillea IX, p. 33; Syll. Fung. I, p. 42, on *Olea verrucosa*, South Africa, Rabh. W., F. Eur. 365.

Lembosia albersii P. Henn., Bot. Jahrb. XXVIII, p. 39; Syll. Fung. XVII, p. 897, on *Elaeodendron* sp., East Africa.

Segesia elegantula Syd., Engl. Bot. Jahrb., 1910, p. 463; Syll. Fung. XXII, p. 522, on *Xymalos* sp., Uganda.

On *Olea verrucosa* leg. MacOwan, 3991, Rabh. F. Eur. 3651; Wellington, C.P., 10.11.10, Doidge [1033]; Langholm Estates, Bathurst Dist., 14.7.19, Doidge [12346]; Barberton, 30.2.15, Thorncroft [8826].

On *Olea exasperata*, Belmont Valley, Grahamstown, 15.1.17, Doidge [10955].

On *Olea capensis*, Van Stadens Pass, 17.5.18, Pole Evans [11444]; Hoggs Back, C.P., 15.1.18, J. and M. Henderson [11339]; Paddock, Natal, 22.12.13, V. d. Bijl [8875].

On *Olea woodiana*, East London, 24.11.17, Doidge [10902].

On *Olea laurifolia*, Hoggs Back, C.P., 15.1.18, J. and M. Henderson [11343]; Kirstenbosch, December, 1916, Glover [10043]; Howiesons Poort, Grahamstown, 12.7.19, Doidge [12387]; Fort Cunynghame, March, 1915 [8896]; Schwarzwald, Victoria East, C.P., 11.8.15, V. d. Bijl [9464].

On *Elaeodendron croceum*, Kentani, 20.7.12, Pegler [2533]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12288]; Knysna, 3.6.12, Pienaar [2435].

On *Elaeodendron capense*, Grahamstown, 13.12.11, Burtt-Davy [2070]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12295].

Stromata amphigenous but more frequently epiphyllous, forming dark brown to black, orbicular spots up to 2–4 mm. diam. These are usually quite distinctly radiate and fibrillar in structure, even to the naked eye.

The hypostroma may be detected within the leaf, lying between the epidermis and the palisade cells, and pushing down between the latter. In the *Elaeodendron* spp. there is more than one row of epidermal cells; but even then the internal mycelium penetrates between all the rows of cells as far as the palisade tissue. At certain points the hypostroma becomes much thickened and a hyphal mass is produced above the palisade cells which gives rise to a short, dark, cylindrical column of perpendicular prosenchymatous structure. This column or foot ruptures the epidermis and the hyphae composing it flatten out horizontally and form the stroma; certain of the hyphae form a hypothecium about 10 μ thick, and others growing to a higher level produce the radial covering membrane. The illustration of the stroma of *Asterodothis solaris* in the Annales Mycologici [13 (1915), Tafel I, Fig. 10] is somewhat misleading, as it depicts the loculi in close contact with the central column. This is not always the case, as in the large number of sections examined of the fungus on various hosts the central part of the stroma was sterile and the loculi were at some little distance, closely crowded, forming a sort of crown round central point or being irregularly scattered about the centre.

The central part of the stroma as seen in a surface section may be parenchymatous in structure, in which case the loculi show as small mounds; but frequently the loculi appear as dense black bodies borne on radiating hyphal strands which are more or less connected with one another. The loculi (external measurement) are round 200–250 μ diam., or oval, 250–300 μ × 140–200 μ; they dehisce irregularly by a stellate or longitudinal fissure.

In section the loculi are 120–160 μ high, and are connected with the intramatrical hypostroma by numerous dark coloured fungus pegs which pass through the stromata. This fact is not mentioned by Theissen.

Radiating from the stroma are numerous hyphae which are almost straight, dark brown, septate, 5–6 μ thick; these often become adnate by their radial walls and form hyphal strands. The hyphae produce branches, which form acute angles with the parent hypha.

On the hyphae are borne numerous outgrowths which may be regarded as rudimentary setae or bristles. These are sometimes very short and almost like hyphopodia in appearance; more frequently they are more or less erect, truncate, and up to 25 μ × 7–8 μ. On the hyphae are also borne very dark brown, club-shaped conidia, which are 3–4 septate, blunt at the ends, and 36–42 μ × 11–12 μ.

The fruiting layer is flat and the asci parallel, oval to clavate, eight-spored, 70–90 μ × 24–28 μ. Paraphyses numerous, filiform. Spores distichous, ellipsoid, reddish-brown, smooth, 27–31 μ long, upper cell 10–12 μ broad, lower cell 8–10 μ broad.

The spores have a peculiar method of germination, the germ tubes appearing on the medial constriction between the two loculi, one on each side.

A fungus with a similar conidia to *Asterodothis solaris* has been collected on *Myrsine melanophleos* [10908] and [8995], but unfortunately neither of these two collections bear mature ascostromata.

10. **Polyrhizon bewsii** n. sp.

On living leaves of *Elaeodendron aethiopicum*, Bisley, near Maritzburg, Natal, 11.4.17, Bews [10087]; 20.7.18, Doidge [11592].

Stromata amphigenous, scattered, raised, round to irregular, about 1 mm. diam., simple or compound, in the latter case 2–3 or more stromata arising close together become confluent. There is no discoloration of the leaf tissues in the neighbourhood of the stroma.

Intramatrical mycelium copious, consisting of colourless hyphae 3·5–4 μ thick, filling the intercellular spaces and penetrating right through the leaf so that stromata are usually formed at corresponding points on the upper and lower surface, one being older than the other. Each stroma is attached to the leaf by a central foot, which is a continuation of the brown compact hypostroma formed in the epidermal and sub-epidermal cells. This foot is 80–160 μ thick, and is continued into the stroma, forming a dark, cellular hypothecium, around which the loculi are arranged. Apart from the central foot the stromata are unattached, lying free on the leaf surface. In old stromata the asci above the foot break away, leaving a cavity, so that the loculi have the appearance of being arranged in a circle around a sterile centre.

Covering membrane black, carbonaceous, radiating in structure at margin, rugose. Diameter of a single stroma is 700–1000 μ; height, excluding foot, 200–270 μ.

Asci paraphysate, briefly pedicellate, eight-spored, 70–100 μ × 30–45 μ, ovate, thick-walled round apex, with conglobate spores when immature; later becoming more elongated, clavate, with distichous spores. Paraphyses linear, about 3·5 μ thick. Spores two-celled, almost black, opaque, slightly constricted, ellipsoid, upper loculus slightly larger, 30–33 μ × 13·5–15 μ.

Polyrhizon bewsii Doidge, nov. sp.

Stromata amphigena, orbicularia, atra, carbonacea, circ. 1 mm. diam., centro affixa, e 1-pluribus ascomatibus circinantibus concreta. Ascomata partialia, pede centrali 80–160 μ cr., epidermide innata, versus marginum radiato-contexta, 700–1000 μ diam., 200–270 μ alto, loculis rotundatis, immersis. Asci paraphysati, clavati, breviter pedicellati, octospori, 70–100 μ × 30–45 μ, paraphysibus linearibus, 3·5 μ cr. Sporae didumae, brunneae, opacae, leniter constrictae, elongatae, loculo supero paullo majore, 30–33 μ × 13·5–15 μ.

Hab. in foliis *Elaeodendri aethiopici*, Natal, 1.9.17, leg. Bews et Doidge [10087] et [11592].

11. **Placoasterella rehmii** (P. Henn.) Theiss. et Syd.

Ann. Myc. XIII (1915), p. 237.

Syn. *Asterella rehmii* P. Henn., Engl. Bot. Jahrb. XVII, p. 114; Sacc. Syll. Fung. XI, p. 257.

On *Aloe arborescens*, Ripplemead, Dohne, Stutterheim Dist., 25.2.15, Bell Edmonds [8899].

On *Aloe mitriformis*, Montague Baths, December, 1915, Pole Evans [9417].

On *Aloe natalensis*, Botanic Gardens, Maritzburg, 8.4.11, Pole Evans [1440].

On *Aloe* sp., New Hanover, Natal, 9.9.13, V. d. Bijl [8892].

This fungus was originally described as occurring in Abyssinia on *Aloe abyssinica* and *Aloe maculata*.

Aerial mycelium not very copious, consisting of brown hyphae, 3·5–5 μ thick, very tortuous, branched, and anastomosing. Stromata scattered or confluent in small groups, either round, 150–200 μ diam., or more frequently elliptic, 200–280 μ × 120–150 μ; in the latter case straight or curved; when two or three are confluent the stroma often appears to be forked; dehiscing by an irregular, round, or elongated fissure.

The cuticle of the leaf is stained with a red pigment where it has been attacked by the fungus, and the discoloration spreads into the palisade cells. The discoloured parts of the leaf tissue are swollen, so that the stromata lie on round, reddish or brown blisters, which are up to 5 mm. diam., and which are often so numerous as to become confluent.

Hypostroma epidermal, filling certain of the epidermal cells with dark hyphal balls, especially under the centre of the superficial fruiting bodies ; mycelial strands also penetrate between the palisade cells.

Fruiting body usually unilocular, 60–80 μ high, with a thin black outer wall. Asci oval to clavate, aparaphysate, eight-spored, apedicellate, thick-walled round apex, staining brick red with iodine, 36–40 μ × 22½–25 μ. Spores brown, two-celled, constricted ellipsoid, cells almost equal, upper loculus somewhat broader, 18–23 μ × 8–10 μ.

12. **Hysterostoma orbiculata** Syd.

Ann. Myc. XIII (1915), p. 239.

Syn. *Dothidasteromella orbiculata* Syd., Ann. Myc. X (1912), p. 41.

On *Olea verrucosa*, Wellington, C.P., 18.11.10, Doidge [1031]; Port Elizabeth, 17.10.09, West (immature) [1870].

In renaming this fungus, Theissen and Syd. (*loc. cit.*) remark that the species has been described from insufficient material, and that the diagnosis could be much improved after studying well-developed specimens.

There is in the National Herbarium abundant material of the same collection as the type [1031], and much of this is in excellent condition. I am, however, only able to add a few details to the description cited above.

Stromata usually epiphyllous, less commonly hypophyllous, circular in outline, dull black, 4–6 mm. in diameter, carbonaceous ; the surface is rough and traversed by deep fissures or clefts. Each stroma is surrounded by a radiating fringe of hyphae, which are septate, 4–6 μ thick, and run parallel to one another. These hyphae are, as a rule, not branched, and are often fused by their lateral walls into hyphal strands, but are not compacted into a stroma.

The central part of the stroma consists of numerous loculi, which are irregularly arranged ; they are round to irregular in shape and very closely crowded, 250–300 μ in diameter. The lateral walls are almost perpendicular, the total height of the ascostroma being 240–270 μ. The outer covering is radial in structure, and it breaks down irregularly at maturity.

There appear to be no stomata on the upper surface of the leaf of *Olea verrucosa*, but there are at intervals folds or clefts in the cuticle similar to those beneath which the guard cells are formed on the lower surface. The hypostroma of the fungus is found in the epidermal cells, between the epidermis and the cuticle and in the thickness of the cuticle itself ; here it is pseudo-cellular and dark brown. There is also an almost continuous layer of colourless, interwoven hyphae lying between the epidermis and the palisade cells and penetrating into the upper part of the latter. The dark-coloured hypostroma breaks through the leaf, often at the clefts mentioned above ; the cuticle is split irregularly in several directions, and through the fissures thus formed the hypostromal tissue grows and produces the fruiting bodies, the hypothecium being in direct connection with the hypostroma at several points under each loculus.

The hypothecium is brown, similar in texture to the hypostroma in the epidermal cells and cuticle, but less dense ; it is about 90–100 μ high in the centre of each loculus, where it forms an irregular cushion, on which the asci are borne, and becomes much thinner at the periphery, measuring about 45 μ. Asci elongated, club-shaped, paraphysate, eight-spored, thick walled round the apex, 75–140 μ × 16–32 μ. Paraphyses numerous, filiform, 2–3 μ thick, becoming more or less conglutinate at the tips and forming an epithecial layer. The asci do not react to iodine, but stain a brick-red colour. Spores usually distichous, oblong, medially uniseptate, brown, thick walled, 30–34 μ × 12–15 μ, upper loculus very slightly broader and more broadly rounded than the lower.

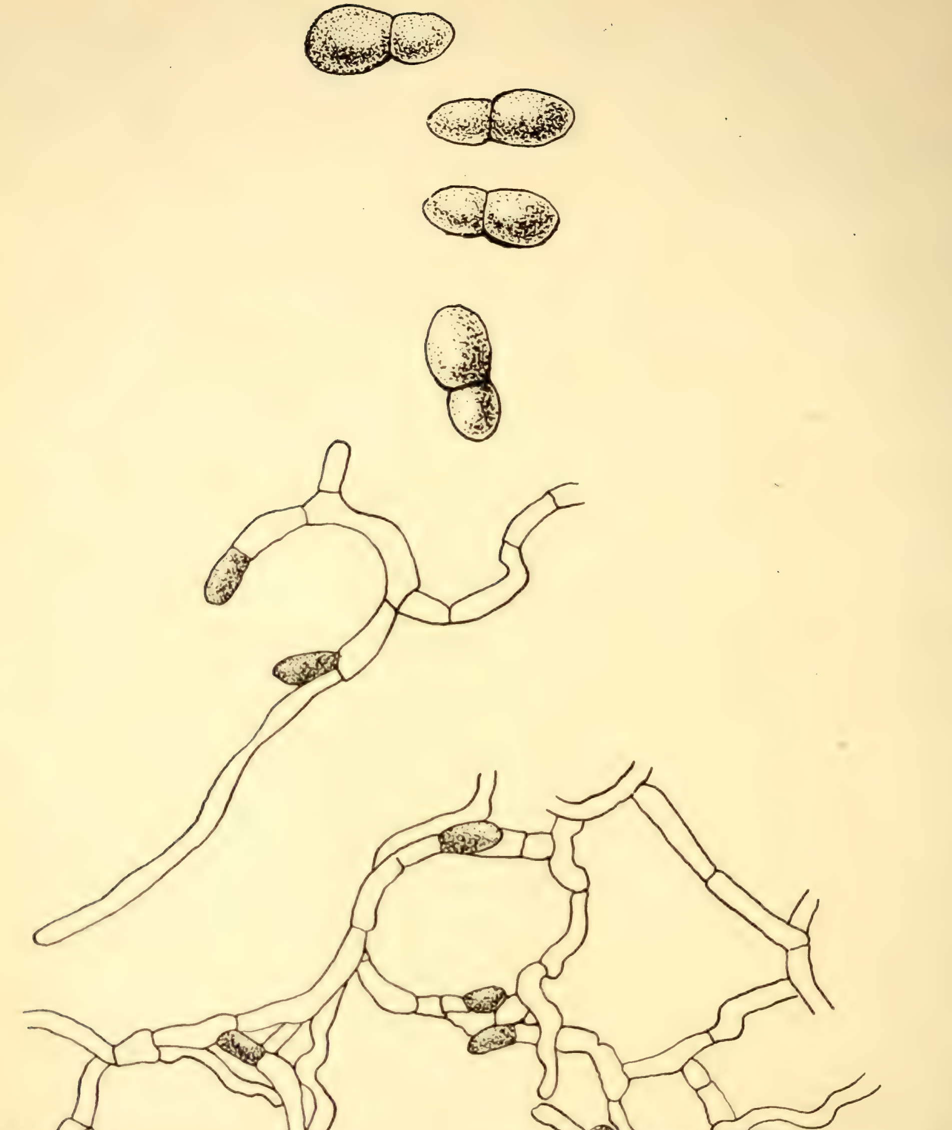

Fig. 2.—Mycelium and spores of *Isipinga areolata.*

13. **Isipinga** Doidge, nov. gen. *Polystomellacearum.*

Mycelium superficialum, ramosum, septatum, hyphopodiatum. Stromata superficialia ex hypostromate subcuticulari oriunda, pluries affixa. Loculi inordinate dispositi, rotundati vel elliptici (non lineares). Asci paraphysati, octospori. Sporae phaeodidymae.

This genus differs from *Hysterostoma* Theiss. in the presence of a well-developed aerial mycelium, and from *Asterodothis* in the absence of a central column or foot.

Isipinga areolata n. sp.

On leaves of *Euclea natalensis*, Isipingo Beach, Natal, 21.5.17, Doidge [10153]; 13.5.13, Doidge [6647]; near Durban, Natal, 25.5.97, Medley Wood [9520] (Wood No. 6447); 25.5.15, Doidge [8986]; 13.1.18, V. d. Bijl [11363].

Hypophyllous, usually near the reflexed leaf margin, less frequently scattered over the whole under-surface of the leaf, forming circular, dull-black areas, 5–15 mm. diam., often coalescing and forming irregular black blotches, especially along the leaf margins; stromata scattered and visible as small denser black points.

Aerial mycelium well developed, hyphae fuscous, 3·5–5 μ thick, branching freely and anastomosing to form regular, circular, or slightly oval areolae, 30–50 μ diam.; hyphopodia unicellular, darker than the hyphae, ovate or ellipsoid, straight or curved, 8–10 μ × 5 μ. Stromata scattered, circular or oval, opaque black, 300–350 μ diam. or about 400 μ × 240 μ, formed of radiating cells; arising from a subcuticular hypostroma which breaks through the cuticle to form the stromata in the cavities above the sunken stomata; stromata attached to host at several points by dark brown or black fungous pegs, which are up to 20 μ thick where they penetrate the cuticle; height of fruiting body is 80–100 μ, each stroma containing several round to irregular loculi; the dark covering membrane slopes gradually towards the leaf surface at the circumference of the stroma. Loculi dehisce at maturity by irregular fissures in the covering membrane.

Paraphyses fairly numerous, hyaline, linear, about 3 μ thick, slightly exceeding the asci. Asci eight-spored, ovate or broadly ellipsoid, thick walled round apex, 50–65 μ × 33–40 μ, not reacting to iodine, but staining a sort of brick-red colour. Spores tristichous or conglobate, brown, two-celled, 27–32 μ × 13–13·5 μ, constricted, upper loculus larger.

Isipinga areolata Doidge, n. sp.

Mycelium hypophyllum, bene evolutum, ramosum, areolatum ex hyphis 3·5–5 μ crassis, anastomosantibus, hyphopodiis continuis, ovatis v. ellipsoideis, rectis v. curvatis, 8–10 μ × 5 μ, compositum. Stromata sparsa, rotundata v. elliptica, atra, opaca, 300–350 μ diam.; v. elliptica, circ. 400 μ × 240 μ, radiatim contexta, hypostromate subcuticulare oriunda, pluries affixa. Loculi inordinate dispositi, 80–100 μ alti. Asci octospori, ovati vel late ellipsoidei, 50–65 μ × 33–40 μ, paraphysate; paraphysibus filiformis, hyalinis, 3 μ crassis. Sporae tristichae v. conglobatae, brunneae, 1-septatae, 27–32 μ × 13–13·5 μ, constrictae loculo supero, paullo majore.

Hab. in foliis *Eucleae natalensis*, Isipingo, Natal, 21.5.17, leg. Doidge [10153].

14. **Isipinga contorta** Doidge.

Syn. *Dothidasteromella contorta* Doidge, Trans. Roy. Soc. of S.A. VIII, Part 3, 1920.

On leaves of *Trichocladus ellipticus*, Branders' High Forest, Victoria East, 14.8.15, V. d. Bijl [9462]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12298].

Forms small, dull-black, round, or irregular areas on upper surface of the leaves; the leaf tissues become discoloured in the neighbourhood of the fungus, right through to the lower epidermis. Aerial mycelium well developed, primary hyphae long, radiating, fuscous, 3–3·5 μ thick, with unicellular hyphopodia which are alternate or unilateral, subglobose, 6–7 μ diam.; between the radiating hyphae there is a densely interwoven mass of paler secondary hyphae which are very tortuous and crumpled, copiously branched, and anastomosing. Stromata scattered, opaque, black, 250–350 μ diam., with radiating structure, unilocular, attached at several points, and arising from a well-developed subcuticular hypostroma. Asci paraphysate, ellipsoid, or ovate, very briefly stipitate, straight or curved, 55–80 μ × 20–25 μ; paraphyses numerous, linear, flexuose, or somewhat crumpled. Spores distichous or conglobate, 1-septate, slightly constricted, upper loculus broader, 16–20 μ × 8–10 μ.

15. **Polystomella caulicola** n. sp.

On stems of *Asparagus* sp., banks of Orange River, Aliwal North, 11.1.12, Pienaar [2093].

Stromata caulicolous, usually irregularly elliptic to linear in outline, elongated in a direction parallel with the stem axis, up to 8 mm. long, varying in width, 80–100 μ high; often confluent and quite irregular in outline, attached at many points; surface rough, dull black. Covering membrane black, carbonaceous, formed of radiating hyphae about 3·5 μ thick and consisting of numerous *Microthyrium*-like discs fused together at the edges; the membrane covers a number of flattened loculi which are 100–150 μ diam. and 80–90 μ high, and are separated by thin walled plectenchyma which are colourless or light brown. Hypothecium delicate, thin, colourless. Asci paraphysate, cylindrical-clavate, eight-spored, briefly pedicellate, 50–70 μ × 18–20 μ. Spores distichous, ellipsoid, hyaline, two-celled, very slightly constricted, cells sub-equal, 17–20 μ × 6–8·5 μ (not quite mature).

Hypostroma well developed in the epidermis and penetrating into the sub-epidermal cells.

Polystomella caulicola Doidge, n. sp.

Stromata caulicola, elongata, usque 8 mm. longa, 80–100 μ alta, pluries affixa, membrana una radiato e cellulis 3·5 μ cr. contexta, carbonacea, ex pluribus quasi-Microthyriis conflata tecta, ex hypothecio epidermali oriunda. Loculi rotundati, 100–150 μ diam., 80–90 μ alti, hypothecio tenue, hyaline. Asci paraphysati, cylindracei v. clavati, octospori, breviter pedicellati, 50–70 μ × 18–20 μ. Sporae distichae, ellipsoidae, hyalodidymae, leniter constrictae, loculus subaequalibus, 17–20 μ × 6–8·5 μ (vix maturis).

Hab. in caulibus *Asparagi* sp., Aliwal North, 11.1.12, leg. Pienaar [2093].

16. **Palawaniella** Doidge, nov. gen. *Polystomellacearum*.

Stromata superficialia, orbicularia, pluries affixa, hypostromate in epidermide bene evoluto, radiato-contexta, carbonacea; mycelio libero nullo; loculis e medio evoluto, plus minusve annulatim dispositis, sed discretis, rotundatis; hypothecium tenue; asci paraphysati, octospori; sporae phaeodidymae.

This genus differs from *Palawania* chiefly in the centrifugal development of the stromata, and in the epidermal, rather than sub-epidermal hypostroma. It differs from *Pleiostomella* in the brown, two-celled spores; the loculi are less definitely arranged in concentric rings.

Palawaniella eucleae n. sp.

On living leaves of *Euclea macrophylla*. Howiesons Poort, near Grahamstown, 12.7.19, Doidge [12375].

Stromata epiphyllous, scattered, round, 4–7 mm. diam., loculi developing centrifugally and arranged in more or less definite concentric circles; these show first of all as minute black points, which increase in size up to 160–500 μ diam.; in the centre the loculi are very closely crowded; towards the circumference they are more scattered, but in either case they are round to oblong, discrete, 80–90 μ high, adnate with their whole base to the substratum. The outer wall is radial in structure and splits at maturity by irregular stellate or, less frequently, longitudinal fissures.

Hypostroma well developed, formed of fuliginous hyphae which form compact balls in the epidermal cells; hyphae may often be traced running between the palisade cells and the epidermal cells, and so connecting adjacent loculi. There are no stomata on the upper surface of the leaf and the cuticle is not ruptured, the ascus-bearing stroma being connected with the hypostroma in the epidermal cells by numerous fine, colourless filaments, which penetrate the cuticle; these are about 1–1·5 μ thick. Hypothecium thin, colourless.

Asci paraphysate, eight-spored, very briefly pedicellate, clavate to ovate, thick walled at apex, 43–57 μ × 23–27 μ; they do not react to iodine. Paraphyses very numerous, hyaline, filiform 2·5–3 μ thick, slightly exceeding the asci. Spores distichous or conglobate, ellipsoid, two-celled, fuscous, later brown, very slightly constricted, cells almost equal, 20–21 μ × 8·5–10 μ.

Palawaniella eucleae Doidge, nov. sp.

Stromata ascophora epiphylla, superficialia, sparsa, 4–7 mm. diam., radiato-contexta; hypostromati epidermali; loculi numerosi, e medio evoluti plus minusve concentrice dispositi, sed discreti, rotundati v. elliptici, 160–500 μ lati, 80–90 μ alti; hypothecio tenue. Asci paraphysati, octospori, brevissime pedicellati, clavati v. ovati, ad apicem incrassati, 43–57 μ × 23–27 μ; paraphysibus numerosis, hyalinis, filiformis, sporae distichae v. conglobatae, ellipticae, medio septatae, brunneae, leniter constrictae, loculis subaequalibus, 20–21 μ × 8·5–10 μ.

Hab. in foliis *Eucleae macrophyllae*, Howiesons Poort, 12.7.19, leg. Doidge [12375].

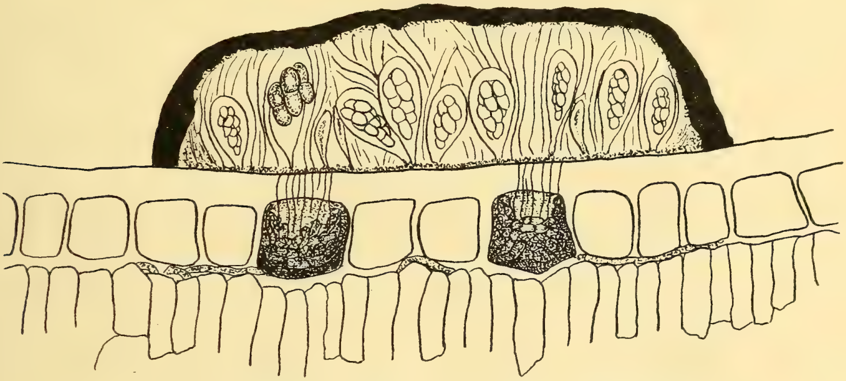

Fig. 3.—Section through loculus of *Palawaniella eucleae*.

17. **Pleiostomella Halleriae** n. sp.

On *Halleria lucida*, Louis Trichardt, 8.4.19, Putterill [11847]; Van Stadens Pass, C.P., 13.11.17, Doidge [10872]; Howiesons Poort, Grahamstown, 17.11.17, Doidge [10959]; Buccleuch, Natal, 17.7.18, Doidge [11585]; Howiesons Poort, 12.7.19, Doidge [12384].

On *Halleria elliptica*, Kentani, 4.12.15, Pegler (Pegler 2348) [9163].

Stromata epiphyllous, superficial, scattered, round, up to 3 mm. diam., obscurely brown, 100–115 μ high, attached at many points, radiate in structure, with an opaque, rugose covering membrane 30–45 μ thick; hypothecium brown, 30–36 μ thick, loculi numerous, densely crowded in concentric circles, but discrete, round, 190–250 μ diam., or becoming oval by crowding and then 250–280 μ × 160 μ. Hypostroma epidermal, but occasionally, in centre of stroma, more deeply seated and invading the palisade cells. Asci ovate, 50 μ × 26–33 μ or clavate, 66–70 μ × 20–23 μ, thickened at apex, eight-spored; paraphyses hyaline, linear, about 1·5 μ thick, soon disappearing. Spores distichous or tristichous, at first equally or sub-equally 1-septate, constricted, later muriform, usually transversely 5 (rarely) 7-septate, and with a longitudinal septum running the length of spore, rarely constricted at secondary septa; septa very delicate, plasma granular, hyaline (mature?) 22–24 μ × 9–10 μ. Asci stain brick-red with iodine.

Pleiostomella Halleriae Doidge, nov. sp.

Stromata ascophora superficialia, sparsa, rotundata, usque 3 mm. diam., obscure brunnea, 100–115 μ alta, radiato-contexta, pluries affixa; hypostromate epidermali; strato tegente opaco, 30–45 μ crasso; loculi numerosi, dense concentrique dispositi, sed discreti, 190–250 μ diam., vel elliptici, 250–280 μ × 160 μ. Asci ovati, 50 μ × 26–33 μ, vel clavati, 66–70 μ × 22–23 μ, ad apicem incrassati, octospori, paraphysati ; paraphysibus filiformis, mox mucosis praesentibus. Sporae distichae v. tristichae, oblongae, utrinque rotundatae, hyalinae (an semper ?) medio v. paullo supra medium septatae, deinde transverse 5, rare 7 septatae, septis tenuissimis, cellulis pluribus v. omnibus septo longitudinali divisis, plasmate granuloso, 22–24 μ × 9–10 μ.

Hab. in foliis *Halleriae lucidae*, Louis Trichardt, 8.4.19, leg. Putterill [11847].

18. **Diplochorella amphimelaena** (Mont.) Theiss. and Syd.

Ann. Myc., 1914, p. 277.

Syn. *Dothidea amphimelaena* Mont.

Ann. Sc., Nat. II, Ser. t. XX, p. 372. Syll. Crypt., p. 222.

Homostegia amphimelaena Sacc. Syll. Fing. II, p. 650.
Phyllachora osyridis Cke., Grevillea XIII, p. 64.
Dothidella osyridis Berl. et Vogl., Syll. Fung. IX, p. 1038.
Dothidella osyridis var. *tassiana* Sacc., Syll. Fung. XIV, p. 676.
Microcyclus osyridis Sacc., Ann. Myc. II, 1904, p. 165.
Microcyclus tassianus Syd., Ann. Myc. II, 1904, p. 165.

On *Osyris compressa*, Muizenberg, C.P., 1883, MacOwan (Rabh. Wint. Fung. Eur. 3562) [3902] ; Port Elizabeth, 23.3.11, Doidge [1243] ; St. James, Capetown, 10.12.11, Pole Evans [1982] ; Kloof Neck, Capetown, 24.2.12, Doidge [2155] ; Muizenberg, 12.4.12, Beardmore [2292] ; Belmont Valley, Grahamstown, 15.11.17, Doidge [10954] ; Kalk Bay, January, 1918, Potts [11302].

Compound stromata, circular, 2–3 mm. diam., forming flat, raised discs on both sides of the leaf, with almost vertical edges, silver grey on the surface, thickly beset with erumpent punctiform, dull black bodies about 50 μ diam., which eventually cover the whole surface. The densely crowded loculi develop under the epidermis—the apex of each separately rupturing the epidermis—and become somewhat raised above it. Gradually the part of the epidermis intermediate between the apices of the loculi disappears and the surface becomes altogether black. The leaf is normally 500–550 μ thick, but through the action of the fungus on both leaf surfaces it is often up to 1300 μ thick. The central leaf tissue is colourless and free from fungous stroma to a thickness of 700 μ ; above and below this the stromatic layer develops, which is again differentiated into two layers, the outer composed of the loculi and the inner of the basal hyphal stroma. The first consists of closely crowded, perithecium-like loculi, which are 120 μ high and 85–95 μ diam., and which are more or less connected laterally. From the base of the loculi the hyphae of the vegetative stroma run vertically inwards, forming a fairly sharply defined stromatic plate 120–170 μ thick. The loculi are typically composed of grey-brown, laterally compressed cells which are 14–15 μ long, 5 μ thick, and 8–9 μ broad, and are in close contact by their flat sides. These hyphae sometimes penetrate inwards in more or less compact strands, but only to a limited depth, and the intermediate leaf tissue is not destroyed. Towards the base of the loculi the greater part of the flat cells become polyhedral or regularly elliptic and somewhat smaller and form a sort of wall round the loculi consisting of a few concentric layers of cells ; they also fill up the spaces between the loculi ; the cells are dark brown and thick walled. There is apparently no stromatic connection between the stromata on the upper and lower leaf surfaces.

Asci aparaphysate, basal, short cylindrical, 35 μ × 12 μ, apedicellate, eight-spored. Spores polystichous, hyaline, two-celled, 12–13 μ × 4 μ, constricted at the septum ; lower cell twice the length of the upper.

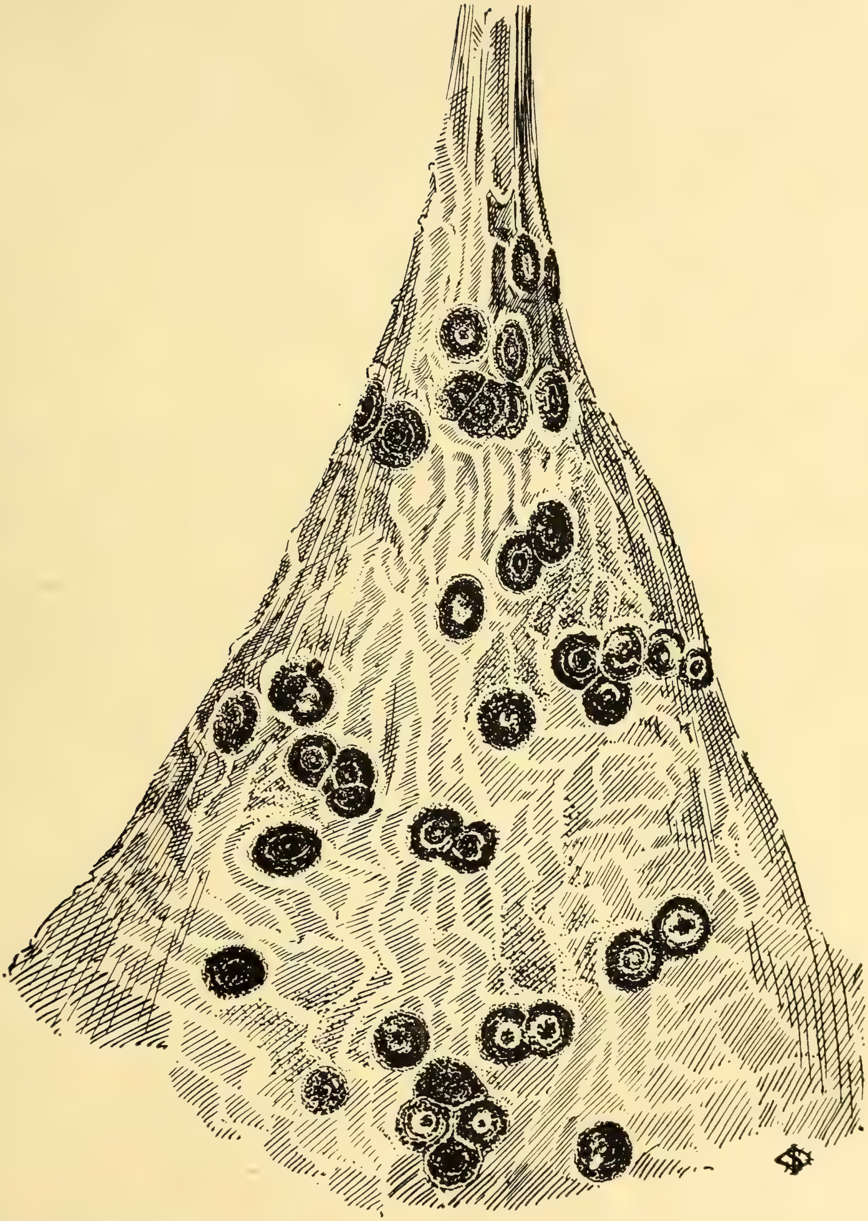

Fig. 4.—*Montagnella maxima.*

19. **Montagnella maxima** Mass.

Gardener's Chronicle, 1899, p. 291, c.i.e. ; Syll. Fung. XVI, p. 630.
Ann. Myc. XVI, p. 630 ; Ann. Myc. XIII (1915), p. 638, Fig. 4.

On *Aloe ferox*, Port Elizabeth, 24.3.12, Doidge [2274] ; Uitenhage, 15.5.12, Pienaar [2496] ; Graaff-Reinet, 1.4.12, Burtt-Davy [5156].

On *Aloe platylepis*, Port Elizabeth, 23.3.11, Doidge [1312].

This fungus forms large raised galls about 1 mm. high ; on both sides of the leaf, they are circular or oval and up to 1 cm. diam. The stroma breaks through the epidermis, forming a number of little furrows which are arranged in numerous concentric circles. The vegetative stroma extends perpendicularly downwards into the gall tissue, filling the intercellular spaces with smooth, light brown hyphae 3½–4 μ thick ; before they break through the epidermis these become collected together and form a thick compact weft, on which are formed in groups the narrow, almost free loculi. These in section are 135 μ high and 100 μ diam., the stromatic base of each group being 160–240 μ thick. Asci basal, aparaphysate, broadly clavate to oval, very briefly pedicellate, 58–68 μ × 30–40 μ ; spores brown, tristichous, oblong, 30 μ × 6–8 μ, four-celled, constricted in the middle, rounded at both ends, straight.

20. **Elmerococcum peglerae** (Pole Evans) Doidge.

Syn. *Montagnella peglerae* Pole Evans, Ann. Bolus Herb. II, p. 5.

On leaves of *Myrsine melanophleos*, Kentani, 3.4.12, Pegler [2206] ; May, 1913, Pegler [6620].

Stromata hypophyllous, black, punctiform, not more than 0·5 mm. diam., attached to the leaf by a central foot which breaks out through a stoma. The central foot gives rise to a thick basal cushion of sterile plectenchyma, on which are borne the small bolster-shaped ascostroma and one or two sub-spherical pycnidia, both being flattened laterally by contact. The stroma is often surrounded by a short sparse fringe of fuscous hyphae, which are septate and 3–3·5 μ thick. Ascostroma 300–430 μ × 200–270 μ and about 80–90 μ high, unilocular ; wall consisting of polyhedral plectenchyma. Asci paraphysate, oval to clavate, very briefly pedicellate, 60–70 μ × 23–27 μ ; paraphyses not numerous, filiform, exceeding the asci. Spores distichous, hyaline, 3-septate, clavate to ellipsoid, not constricted, 27–30 μ × 9–10 μ. Pycnidia 160–200 μ diam. ; conidia very numerous, minute, bacilloid.

Elmerococcum peglerae Doidge, nov. sp.

Stromata erumpenti-superficialia, centro affixa, orbicularia v. elliptica, usque 5 mm. diam. ; ascostroma unica et pycnidia unica vel dua in quaque stromati aggregata. Ascostromata nigra, perithecioidea, elliptica 300–430 μ longa, 200–270 μ lata, 80–90 μ alta. Asci ovati vel clavati, paraphysati, breviter pedicellati, 60–70 μ × 23–27 μ. Sporae distichae, hyaline, 3-septatae 27–30 μ × 9–10 μ. Pycnidia rotundata 160–200 μ diam. ; conidiis minutis bacillaribus.

Hab. in foliis *Myrsine melanophleos*, Kentani, 3.4.12, Pegler [2206] ; May, 1913, Pegler [6620].

21. **Rosenscheldia horridula** n. sp.

On living leaves of *Olea capensis*, Umgeni Beach, Durban, 4.6.12, Pole Evans [3149] ; East London, 19.7.19, Doidge [12411].

On *Olea woodiana*, East London, 24.11.17, Doidge [10903].

Stromata usually hypophyllous, less frequently epiphyllous, very numerous, but not large, up to 2 mm. diam. Often larger, irregular stromata are formed by confluence.

In the intercellular spaces under the epidermis the hyphae are colourless and closely packed, passing over into a darker coloured mass of round-polygonal cells 5–6·5 μ diam. This layer of dark, thick-walled cells is rather irregular and here and there penetrates deeper into the leaf tissues. From this stromatic base arise very numerous, closely crowded, cylindrical or club-shaped bodies 200–240 μ high, 96–160 μ thick at the base

160–200 μ thick at the apex. This column has the same prosenchymatous structure as the basal stroma. In the upper, broader part of each there is a single loculus sunk in the stroma; this has no separate wall, but is covered by the polygonal-celled hyphal weft of the stroma column. The cells of this covering layer are larger than those at the base, being 7–10 μ diam.

In this species of *Rosenscheldia* the sterile part of the column is very short, the loculus being sub-spherical 100–150 μ diam. Asci basal, clustered, eight-spored, paraphysate, narrow-clavate, thickened round apex, 55–70 μ × 16–17 μ. Paraphyses numerous, filiform. Spores distichous, four-celled, fuscous, clavate, 20–22 μ long, 6–6·5 μ thick at the broad end.

Rosenscheldia horridula Doidge, nov. sp.

Stromata plerumque hypophylla, minuta, usque 2 mm. diam., v. confluenda majores, columnata, columnis cylindraceis v. clavatis, dense aggregatis, 200–240 μ altis, base 96–160 μ, apice 160–200 μ crassis. Loculi apicales singuli in quaque columna, stromate apicale tegentes, 100–150 μ diam. Asci paraphysati, octospori, clavati, ad apicem incrassati, 55–70 μ × 16–17 μ; paraphysibus numerosis, filiformis. Sporae distichae, 3-septatae, fuscae, clavatae, 20–22 μ × 6–6·5 μ.

Hab. in foliis *Oleae capensis*, Durban, 4.6.12, leg. Pole Evans [5149].

22. **Auerswaldia examinans** (M. et B.) Sacc.

Syll. Fung. II, p. 626.

Syn. *Dothidea examinans* M. et B.—Bl. javan, 520.

Sphaeria examinans Mont. et Berk.—Hooker's Lond. Journ. Bot. I, p. 156.

On bark of old seedling citrus tree, Krantzkloof, Natal, 7.4.14, Bell [7733].

Auerswaldia examinans was originally described as occurring on the bark of a tree in Java. The South African specimen agrees with the description given in the Annales Mycologici (XIII, 1915, p. 298), except that the loculi are somewhat larger.

The bark is thickly beset with the erumpent, dull black, tuberculate stromata in all stages of growth, from the youngest which are punctiform to the mature columns with a length of 800 μ. The surface is rough, granular, covered with the somewhat mammillate protruding apices of the loculi.

The stroma develops under the bark, spreading considerably, and breaking through at several points develops the stromatal columns in which the loculi are formed. The hyphae forming the column are pendicular to the hypostroma, towards the apex becoming indistinctly cellular. In the young fruiting bodies only the hypostroma and the outer layer of the column is dark coloured. The loculi lie in the upper part of the column, and are 140–160 μ × 120–150 μ, circular to ellipsoid, and sunken in the stroma, the latter being raised in a series of minute peaks over the apices of the loculi. The loculi are not ostiolate, dehiscing by the rupture of the outer stromatic wall. Asci basal, clavate-cylindrical, 65 μ × 18 μ, with a short, broad foot 12 μ long. Spores distichous, brown, one-celled, oblong-ellipsoid, rounded at both ends, 20–24 μ × 10–11 μ.

23. **Dothidina disciformis** (Wint.) Theiss. and Syd.

Ann. Myc. XIII (1915), p. 304.

Syn. *Auerswaldia disciformis* Wint.—Hedwigia XXIII, 1884, p. 170; Syll. Fung. IX, p. 1033.

On leaves of *Myrica* sp., near Capetown, 1883, MacOwan (Rabh. Wint. Fung. Eur. 3063) [3403]; Krantzkloof, Natal, 14.8.14, V. d. Bijl [8396]; Uganda, March, 1916, Dummer [11986].

Stromata on both sides of the leaf, round or irregular, often angular, 2–5 mm. broad, forming black, comparatively smooth cushions, raised 200–300 μ above the leaf surface. The epidermis, which is filled with stroma, at first covers the true stroma, but later it becomes torn and pushed back, and is also torn away from the stroma, with which it was at first united. It then surrounds the free erumpent fruiting bodies, being torn into broad black flaps. The inner part of the stroma is comparatively light coloured, but consists of thick-walled hyphae, 6–10 μ broad. Loculi crowded, spherical or spherical-ovate, 120–160 μ diam., not reaching the base of the stroma, without a true wall. Paraphyses filiform. Asci cylindrical, rounded above, narrower at the base, 100–135 μ × 14–16 μ. Spores obliquely monostichous or almost distichous up to eight in an ascus, elliptic, one-celled, olive brown, 17–19 μ × 8–9 μ.

24. **Parastigmatea** Doidge, nov. gen. *Stigmateacearum.*

Omnia ut in *Stigmatea,* sed sporae hyalinae, continuae.

Parastigmatea nervisita n. sp.

On leaves of *Stephania hernandifolia*, Maritzburg, Natal, 26.6.11, Doidge [1656]; 6.4.14, Doidge [8352].

Ascomata epiphyllous, minute, dull black, punctiform, circular, 240–300 μ diam., discrete, but in small groups on main and lateral veins, 80–90 μ high, smooth, remaining covered by the cuticle. Basal membrane brown, about 10 μ thick, composed of concentric layers of compressed hyphae. Covering membrane radial in structure, composed of sinuous hyphae, 3–3·5 μ thick, arched in centre, flat at edges, 6–7 μ thick, dehiscing by a circular central pore; central cavity containing asci about 150 μ diam. Asci paraphysate, ovate or broadly ellipsoid, thick walled, eight-spored, 50–53 μ × 26·5–30 μ. Spores distichous or conglobate, hyaline, sub-clavate or somewhat piriform, rounded at both ends, continuous, 20–24 μ × 8–10 μ.

Parastigmatea nervisita Doidge, nov. sp.

Ascomata epiphylla, minuta, atra, rotundata, in nervibus insidentia, 240–300 μ diam., 80–90 μ alta, laeves, cuticulare tecta, radiatim e hyphis undulatis 3–3·5 μ crassis, contexta. Asci paraphysati, ovati vel late ellipsoidei, 8-spori, 50–53 μ × 26·5–30 μ. Sporae distichae v. conglobatae, hyalinae, continuae, subclavatae v. sub-piriformae, utrinque rotundatae, 20–24 μ × 8–10 μ.

Hab. in foliis *Stephaniae hernandifoliae*, Maritzburg, 26.6.11, et 6.4.14, leg. Doidge [1656] et [8352].

25. **Perischizon oleifolium** (Kalch and Cke.) Syd.

Ann. Myc. XII (1914), p. 265, XII (1915), p. 269.

Syn. *Dothidea oleifolia* Kalch et Cke., Grevillea IX (1880), p. 31.

On *Olea capensis*, 9.1.14, Kirstenbosch, C.P., Pearson [7374].

On *Olea laurifolia*, 21.6.16, Malalane, Eastern Transvaal, Hall [9749].

Stromata amphigenous, scattered or crowded, circular, raised, $\frac{1}{2}$–$\frac{3}{4}$ mm. diam., with a central foot 100–200 μ diam. penetrating into leaf tissues. Surface rough, lumpy, with a single (occasionally double) peripheral wall, beset laterally as well as at the base with bristly, brown, truncate septate hyphae, 100 μ long, 5–8 μ thick, which later disappear. Stroma hard in texture, dark, prosenchymatous, composed of parallel hyphae. The loculi are sunken in the periphery and coalesce to form a circular hymenium, the stromatal cover becoming mucilaginous at maturity and disappearing. Asci clavate, thick-walled round the apex, 90–115 μ × 28–38 μ, eight-spored, embedded in mucilage. Paraphyses simple, thick, clavate at the apex, and 3–4 μ broad, light brown. Spores distichous, ellipsoid-oblong, brown, 26–34 μ × 11–14 μ, two-celled, constricted, abruptly rounded at both ends; upper cell somewhat broader than the lower.

26. **Phragmodothella nervisequens** n. sp.

On leaves of *Burchellia capensis*, Van Stadens Pass, 7.7.18, Pole Evans [11446].

Stromata amphigenous, but mostly hypophyllous, forming elongated, raised, rusty-brown streaks, up to 1 cm. long and 1 mm. broad, on mid-rib and main lateral veins; smaller, punctiform, elongated, or branched on smaller veins. Stromata developed under the epidermis, causing a gall-like hypertrophy of the leaf tissues, later becoming erumpent; 120–160 μ high, the inner part of the stroma being composed of compact brown cells 3–5 μ diam., prosenchymatous between the loculi, and with a darker, roughened crust. Loculi numerous, immersed, sub-spherical, 80–100 μ diam. Asci aparaphysate, eight-spored, clavate or ellipsoid, thick-walled round apex, with a short foot, 45–60 μ × 20–23·5 μ. Spores hyaline, distichous, 3-septate, oblong or somewhat clavate, slightly constricted at the centre, 18–20 μ × 5–6·5 μ.

Phragmodothella nervisiquens Doidge, nov. sp.

Stromata amphigena, plerumque nervisequentes hypophylla, nervis majoribus usque 1 cm. longa et 1 mm. lata; nervis secundariis minores punctiforma, elongata v. ramosa; erumpentia dothideodea, 120–160 μ alta. Loculi numerosi, immersi, suborbiculares, 80–100 μ diam. Asci âparaphysati, octospori, clavati v. ellipsoidei, apice incrassati, breviter pedicellati, 45–60 μ × 20–23·5 μ. Sporae hyalinae, distichae, triseptatae, oblongae v. subclavatae, medio leniter constrictae, 18–20 μ × 5–6·5 μ.

Hab. in foliis *Burchelliae capensis*, Van Stadens Pass, 7.7.18, leg. Pole Evans [11446].

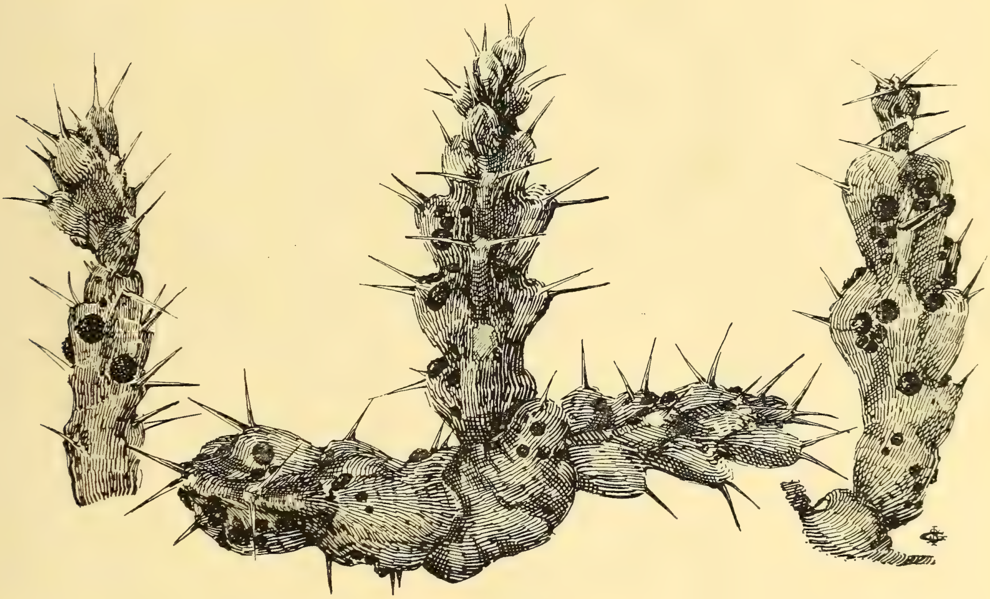

Fig. 5.—*Phragmodothis asperata.*

27. **Phragmodothis asperata** Syd.

Ann. Myc. XIII (1915), p. 345.

On the stem of *Euphorbia schintzii*, Wagenpadsnek, Pretoria Dist., 26.12.11, Pienaar [2159]; 31.12.13 [7353].

Stromata only growing in the outer layers of cells and becoming apparently quite superficial through the rupture of the periderm, almost spherical, 1½–3 mm. diam., 1½–2 mm. high, black, surface much wrinkled and cracked. Interior of stroma brown, the base and periphery being dark, opaque, formed of perpendicular, ascending hexagonal cells 15–19 μ diam. Loculi elliptical, 250 μ × 200 μ, sunken under the periphery, often apparently free through the crumbling away of the stroma surface. Asci clavate, thick-walled, 140–200 μ × 16–32 μ, 6–8 spored. Spores distichous or obliquely monostichous, oblong, four-celled, narrowed towards each end, but not pointed; straight, or one side straight and the other convex, verrucose at maturity. Paraphyses wanting.

28. **Trabutia evansii** Theiss. et Syd.

Ann. Myc. XIII (1915), p. 352.

On *Ficus* sp., Lourenço Marques, Portuguese East Africa, May, 1909, Howard [668].

Stromata only epiphyllous, on inconspicuous yellowish or brownish, discoloured spots, small, circular, 1 mm. diam., usually more or less regularly arranged in groups $\frac{1}{2}$–1 cm. diam., but seldom becoming confluent. Not infrequently these groups are so numerous that they run together, and the whole leaf surface is more or less evenly and thickly beset with the small stromata. Stromata convex, almost hemispherical, unilocular, between the cuticle and the epidermis, composed of grey brown, vertical, parallel hyphae 4–5 μ diam. Clypeus opaque, 50–80 μ thick, loculus 300–450 μ diam., 150–240 μ high, with a wall 15–18 μ thick composed of delicate brown hyphae and concentric in structure. Asci cylindrical with monostichous spores, or clavate with distichous or somewhat conglobate spores (in the latter case the spores are often oblique or transverse), 70–90 $\mu \times$ 10–16 μ, eight-spored. Paraphyses numerous. Spores ellipsoid, abruptly rounded at both ends, continuous, hyaline, 11–14 $\mu \times$ 8–9$\frac{1}{2}$ μ.

29. **Trabutia ficuum** (Niessl.) Theiss. et Syd.

Ann. Myc. XIII (1915), p. 352.

Syn. *Phyllachora ficuum* Niessl. Hedwigia XX. 1881, p. 99. Syll. Fung. II, p. 598.

On *Ficus* sp. Portuguese East Africa, 24.5.1908, Howard [520].

On *Ficus howardiana*, Lourenço Marques, P.E.A., 30.8.1909, Howard [719].

Stromata epiphyllous, shiny black, small, $\frac{1}{2}$–1 mm. diam., raised, irregular, between the cuticle and the epidermis, becoming flat at the edge. In the centre there are a few loculi, 120–140 μ high, with opaque covering stromatal layer about 30 μ thick, the inner part of the stroma is lighter brown. Loculi flattened-spherical or lenticular, from 220 μ diam. and 100 μ high, to 320 μ diam. and 115 μ high. Asci paraphysate, cylindrical-clavate, 55–65 $\mu \times$ 14–18 μ, eight-spored. Spores hyaline, continuous, monodistichous, oval to ellipsoid, rounded at both ends, 11–13 $\mu \times$ 6$\frac{1}{2}$ μ.

30. **Trabutia nervisequens** (Lingelsh) Theiss. et Syd.

Ann. Myc. XIII (1915), p. 353.

Syn. *Phyllachora schweinfurthii* P. Henn., var. *nervisequens* Lingelsh, Engl. Bot. Jahrb. XXXIX, 1907, p. 604.

On *Ficus* sp., Umgeni, near Durban, 21.3.10, Doidge [854]; Malvern, Natal, 28.12.11, Doidge [1994]; Winkle Spruit, Natal, 29.1.12, Pole Evans [2019]; Port Shepstone, Natal, 15.10.12, Pole Evans [5608]; Amanzimtoti, 14.6.14, Franks [7813].

This fungus was originally described on *Ficus hochstetteri*, var. *glabrior* in Abyssinia. It appears to occur quite commonly on the Natal coast.

Stromata epiphyllous, developed on inconspicuous yellowish coloured spots, chiefly along the mid-rib and lateral veins, being elongated in the direction of the vein and more or less confluent. Small stromata only 1 mm. long, larger ones up to 2 cm. long, very slightly shiny, between the cuticle and the epidermis, with one or many loculi, flat, somewhat wavy. The inner part of the stroma is prosenchymatous, composed of brown, parallel hyphae, perpendicular to the leaf surface, and 7–9 μ thick. Loculi lenticular, 400–600 μ diam., 250–300 μ thick. Locular wall comparatively stout, 12–18 μ thick, light brown, composed of numerous concentric layers of very delicate hyphae. Clypeus 40–60 μ thick, stout, opaque. Asci cylindrical, stipitate, paraphysate, 75–110 $\mu \times$ 11–14 μ. Spores usually monostichous, broadly ellipsoid, continuous, hyaline, 12–16 $\mu \times$ 8–10 μ.

On the surface of young stromata a conidial layer is often developed, which produces hyaline, filiform, crumpled conidia.

Var. *robusta* Doidge.

On *Ficus* sp., Port Elizabeth, 20.6.19, Gunn [12248].

Differs from the type in the thickness of the stroma and in the form and size of the loculi. Stroma 400–450 μ high, loculi sub-spherical, 330–370 μ diam., 300–400 μ high.

31. **Catacauma dalbergiicola** (P. Henn.) Th. et Syd.

Ann. Myc., XIII (1915), p. 388.

Syn. *Phyllachora dalbergiicola* P. Henn., Hedwigia XXXVI, 1897, p. 224; Syll. Fung. XIV, p. 664.

On leaves of *Dalbergia armata*, Barberton Dist., August, 1906, Pole Evans [588]; Stella Bush, Durban, 11.7.11, Doidge [1662]; Verulam, Natal, 3.7.13, Pole Evans [6808].

The type specimen is on leaves of *Dalbergia variabilis* and was collected in Brazil. The South African specimens agree exactly with the description of the original, except in the size of the loculi, which are somewhat smaller.

Epiphyllous, taking different forms on different leaves, sometimes very minute, sometimes producing round-angular stromata up to 1½–2 mm. diam., convex, somewhat shiny, between the epidermis and the palisade cells. Clypeus epidermal, opaque, about 35 μ thick, the inner part of the stroma being formed of vertical, parallel, light rusty-brown prosenchyma. Loculi sunken in the stroma, one or more according to the size of the stroma, 240–300 μ diam. and 180–200 μ high (in the original description 360–440 μ diam.), with a thin wall. Asci clavate, paraphysate, 60–70 μ × 16–20 μ. Spores distichous, oblong-ellipsoid, hyaline, continuous, 12–14 μ × 6–7 μ.

32. **Catacauma Pterocarpi** Syd.

Ann. Myc. XIII (1915), p. 387.

Syn. *Phyllachora Pterocarpi* Syd., Ann. Myc., 1912, p. 40.

On *Pterocarpus angolensis*, Letaba Drift, Zoutpansberg Dist., 6.8.11, Doidge [1807]; Barberton, 22.8.12, V. d. Bijl [5132].

Stromata epiphyllous, scattered, small, irregularly circular, 1–2 mm. diam., shiny black, on pale leaf spots, slightly convex, with somewhat undulating surface. Clypeus epidermal, opaque; loculi with their bases on the palisade tissue, 1–6 in each stroma, flattened-spherical, closely appressed to the leaf tissue at the base, with thin brown walls, 350–450 μ diam., 240–300 μ high. The upper parts of the loculi are connected by thick stromatic tissue. Asci paraphysate, clavate-cylindrical, 60–80 μ × 16–24 μ. Spores monostichous or distichous, hyaline, one-celled, elliptic, rounded at both ends, 14–18 μ × 8–9 μ.

The spores of both specimens appear to be somewhat immature. Theissen and Sydow (*loc. cit.*) state that it is doubtful whether there is a working difference between this fungus and *Phaeostroma pterocarpi* Syd. with two-celled spores.

33. **Catacauma Peglerae** n. sp.

On leaves of *Eugenia capensis*, Kentani, 6.7.15, Pegler (Pegler No. 2340) [9099]; Umbogintwini, Natal, 9.5.13, Doidge [6636]; Scottsburgh, Natal, 5.7.13, Pole Evans [6841]; Warner Beach, Natal, 1.4.18, Bottomley [11667].

Stromata epiphyllous, 1–2 mm. diam., circular, often forming larger, irregular stromata by confluence. Central stroma often surrounded by a ring of secondary stromata at a distance of 2–5 mm. (radius), which may be small and discrete, or fuse to form a continuous ring. Stromata black, shining, somewhat conical or mammillate in section. Epidermal clypeus about 40 μ thick, black, opaque, the stroma lying in the cavity between the arched epidermal clypeus and the depressed and hollowed palisade tissue. Locular wall thin and very closely appressed to the palisade cells. Loculi flattened-hemispherical or pear-shaped, 400–600 μ diam. and 350–500 μ high. The loculi are often connected by opaque black stromatic tissue about 150 μ thick. Asci paraphysate, eight-spored, clavate-cylindrical, 120–140 μ × 17–20 μ, with a short foot, 10–13 μ long. Spores mono-distichous, one-celled, hyaline, oval to ellipsoid, 20–23 μ × 12–13 μ.

Catacauma peglerae Doidge, nov. sp.

Stromata epiphylla, 1–2 mm. diam. v. confluendo majores, nonnunquam concentrice disposita, atra, nitidula, subconica, subepidermales. Loculi 400–600 μ diam., 350–500 μ alti, clypeo opaco, aterrimo, 40 μ crasso, parietibus tenuibus. Asci paraphysati, octospori, cylindraceo-clavati, 120–140 μ × 17–20 μ, breviter pedicellati. Sporae monostichae v. distichae, continuae, hyaline, ovatae v. ellipticae, 20–23 μ × 12–13 μ.

Hab. in foliis *Eugeniae capensis*, Kentani, 6.7.15, leg. Pegler [9099].

34. **Catacauma grammicum** (P. Henn.), Theiss. et Syd.

Ann. Myc. XIII (1915), p. 382.

Syn. *Phyllachora grammica* P. Henn., in Flore du Bas et Moyen Congo in Ann. Mus. du Congo, Vol. II, fasc. II, 1907, p. 98.

On leaves of *Ficus capensis*, Lemana, Zoutpansberg Dist., 14.8.11, Doidge [1829]; Kentani, C.P., 1.3.15, Pegler (Pegler No. 1993) [8884].

Stromata scattered, amphigenous, usually only on one side of the leaf, but occasionally an epiphyllous is found opposite to a hypophyllous stroma, following the nerves, forming dull black, linear streaks up to 7 mm. long and 0·8 mm. broad on a yellow brown leaf spot; from these short lateral streaks radiate or form thin connecting branches with neighbouring stromata. Stroma sub-epidermal, the base being sharply defined against the sub-epidermal cell-layer; the sub-epidermal layer and the rest of the mesophyll remaining unchanged even when two stromata are formed opposite to each other, on each of the leaf surfaces; only the region adjoining the base of the stroma is coloured red. The stroma consists of vertical, parallel prosenchyma, in the epidermal clypeus the cells are short and opaque black. Loculi broadly ellipsoid, raising the epidermis in which the clypeus has developed; at the base only resting on a thin line of stroma which is against the sub-epidermal cells, 300–350 μ diam., 140–170 μ high. Asci cylindrical, paraphysate, eight-spored, 45–58 μ × 7–10 μ. Spores monostichous, one-celled, hyaline, ellipsoid, rounded at both ends, 8–10 μ × 4–5½ μ.

35. **Phaeochorella parinarii** (P. Henn.) Th. et Syd.

Ann. Myc. XIII (1915), p. 405.

Syn. *Cocconia parinarii* P. Henn., Engl. Bot. Jahrb. XXX, 1901, p. 257; Syll. Fung. XVIII, p. 159.

On leaves of *Parinarium capense*, Pretoria Dist., October, 1908, Doidge [613]; 10.4.11, Erasmus [1272]; 29.4.11, Doidge [1507]; 8.4.12, Doidge [2203]; Seven Oaks, Natal [10981].

On *Parinarium mobola*, Rhodesia, Howard [730]; Zoutpansberg Dist., 6.8.11, Doidge [1809]; Barberton, 16.8.11, V. d. Bijl [1922]; Zoutpansberg Dist., 19.10.14 [9173].

Stromata epiphyllous, more or less covering the leaf surface, round to irregular, 1½ to 4 mm. in diam., convex, somewhat shiny, black, with a rough surface, 400–450 μ high, with a flat base resting on the sub-epidermal layer of cells, which is not stromatized, covered with an epidermal clypeus, light brown, vertically prosenchymatous in structure. Loculi numerous, pear-shaped, 300–400 μ diam., with an indistinctly periphysate neck. Asci cylindrical, 85–100 μ × 11–15 μ, with delicate, filiform, hyaline paraphyses. Spores up to eight in an ascus, mostly monostichous, elliptic to oblong, rounded at both ends, red-brown, one-celled, with a slender medial hyaline band, 12–17 μ × 8–9 μ.

36. **Phragmocauma viventis** (Cke.) Theiss. et Syd.

Ann. Myc. XIII (1915), p. 41.

Syn. *Dothidea viventis* Cke., Grevillea V, p. 16.
Phyllachora viventis (Cke.) Sacc., Syll. Fung. II, p. 601.
Dothidea viventis var. *albizziae* Cke., *ibid.*
Phyllachora albizziae Cke., Grevillea XIII, p. 65.
Homostegia albizziae (Cke.) Berl et Vogl., Syll. Fung. IX, p. 1049.

On leaves of *Albizzia fastigiata*, Inanda, Natal, May, 1881, Medley Wood (Wood No. 583) [9492] and [16445]; Winklespruit, Natal, 13.4.11 and 2.7.11, Pole Evans [1401] and [1583]; Stella Bush, Durban, 11.7.11, Doigde [1615]; Verulam, Natal, 3.7.13, Pole Evans [6829].

Stromata usually hypophyllous, small, irregular elliptic or oval in outline, somewhat raised, dull black, 0·5 to 0·7 mm. in length, the long axis often lying along a vein or in small groups of 2–4. Stroma arising between the peridermal and the sub-epidermal cells, with its base at the level of the epidermis. Loculi, several, under a common, arched, epidermal clypeus, spherical to lenticular, 190–200 μ diam. at maturity. Asci paraphysate, cylindrical, 80 μ × 10–12 μ, with a foot 15–18 μ long. Spores distichous, colourless, four-celled, constricted at the middle, 20–24 μ × 5–6 μ. The asci do not stain blue with iodine.

37. **Scolecodothis capensis** n. sp.

On leaves of *Olea* (*?*) *foveolata*, Howiesons Poort, Grahamstown, 17.1.17, Doidge [10963]; 12.7.19, Doigde [12379]; Van Stadens Pass, 13.11.17, Doidge [10869].

Stromata amphigenous; the epiphyllous stromata develop first, they are scattered, round to irregular, 1–1½ mm. diam., raised and convex above leaf surface, occasionally larger and irregular in shape by confluence, black and shining. Hypophyllous stromata smaller and flatter, and usually more or less undeveloped and sterile. The leaf tissue is not discoloured. Stroma between the epidermis and the palisade tissue. Clypeus epidermal, thick, opaque, 90–100 μ thick. The inner part of the stroma consisting of lighter brown, prosenchymatous plectenchyma. Loculi 4–5 in each stroma, immersed, lenticular or somewhat irregular by compression, 550–650 μ diam., 200–250 μ high. Asci paraphysate, eight-spored, narrow, ellipsoid, tapering to both ends, pedicellate, 100–120 μ × 13–14 μ. Spores parallel, hyaline, one-celled, narrow, fusiform, pointed at both ends, 60–70 μ × 5–6 μ in centre.

Scolecodothis capensis Doidge, nov. sp.

Stromata amphigena, sparsa, rotundata v. irregulares, 1–1½ mm. diam., convexa, atra, nitidula. Loculi 4–5 in quoque stromate, 550–560 μ diam., 200–250 μ alti; clypeo opaco, aterrimo, 90–100 μ crasso. Asci paraphysati, octosporo, anguste ellipsoidei, utrinque attenuati, pedicellati, 100–120 μ × 13–14 μ. Sporae parallelae, hyalinae, continuae, fusoideae, 60–70 μ × 5–6 μ.

Hab. in foliis *Oleae* (*?*) *foveolatae*, Grahamstown, 17.1.17, leg. Doidge [10963].

38. **Phyllachora caffra** Syd.

Ann. Myc. XV (1917), p. 548.

Syn. *Physalospora caffra* Syd., Ann. Myc. X (1912), p. 39.

On leaves of *Cordia caffra*, Amanzimtoti, Natal, 10.7.11, Doidge [1631].

Stromata epiphyllous, minute, gregarious on irregular rusty-brown spots, 250–300 μ in diam., unilocular; on the upper leaf surface round, punctiform, convex, shining; on the lower surface the epidermis becomes somewhat convex, and later the stroma becomes visible as a minute, dull-black point. Loculi occupying the whole thickness of the leaf, spherical, 250–300 μ diam., with a short epidermal clypeus at the apex, the lateral and basal wall consisting of a weft of hyaline or yellowish threads; where the basal wall is near the lower epidermis, a short clypeus is formed. The leaf, which is normally 200–220 μ thick, becomes arched over the loculus to a thickness of 360 μ. Asci cylindrical, paraphysate, 75–90 μ × 9–12 μ. Spores monostichous, ellipsoid, hyaline, broadly rounded, one-celled, 11–13 μ × 6–8 μ.

39. **Phyllachora dombeyae** Syd.

Ann. Myc. XV (1917), p. 532.

Syn. *Physalospora dcmbeyae* Syd., Ann. Myc. X (1912), p. 441.

On *Dombeya rotundifolia*, Equeefa, Natal, 24.4.11, Fuller [1539].

On *Dombeya schimperiana*, Woodbush, Zoutpansberg Dist., 4.8.11, Doidge [1762].

Stromata epiphyllous, gregarious on yellow leaf spots, $\frac{1}{3}$–$\frac{1}{2}$ mm. diam., convex, somewhat shiny, not visible on the lower leaf surface, or only visible as minute dull black spots; with one or few loculi. Loculi spherical, 160–190 μ diam., covered at the apex with a dark epidermal clypeus, almost without lateral walls, not touching the lower epidermis, or forming a very short clypeus in the lower epidermal cells. Asci clavate, paraphysate 60–75 μ × 15–20 μ. Spores distichous or tristichous, one-celled, hyaline, rounded at both ends, asymmetrical, straight or slightly curved, 25–35 μ × 3–$4\frac{1}{2}$ μ. Conidia filiform, curved 18–26 μ × 1–$1\frac{1}{2}$ μ.

40. **Phyllachora melianthi** (Thuem.) Sacc.

Syll. Fung. IX, p. 1013; Ann. Myc. XIII (1915), p. 528.

Syn. *Rhytisma melianthi* Thuem., Flora, 1876, p. 569.

Cryptomyces melianthi (Thuem.), Sacc., Syll. Fung. VIII, p. 707.

On *Melianthus major*, near Capetown, January, 1884, MacOwan (Rabh. Wint. Fung. Eur. 3557) [3897].

On *Bersama lucens*, Kentani, 3.7.15, Pegler [9017].

Stromata on both sides of the leaves, numerous, scattered, small, unilocular, hemispherically or conically convex, flat at the periphery, $\frac{1}{2}$ mm. diam., black; on the opposite side of the leaf the grey epidermis bulges out, and later becomes filled with stroma and becomes black. Between the two leaf surfaces lies a single large stroma (1–$1\frac{1}{2}$ mm. diam.), which either remains unilocular, surrounded only by a broad, flat, stromatic border, or contains several loculi, and is then not surrounded by sterile stroma. Clypeus epidermal opaque, 15–25 μ thick, inner part of stroma and locular wall consisting of light brown prosenchyma. Locular wall thin, delicate. Loculi flattened spherical, 240–280 μ diam. (in stromata on *Bersama*, 320–450 μ diam.), 240–300 μ high, occupy from three-quarters to the whole of the thickness of the leaf; occasionally irregular in shape where a vascular bundle impinges on locular wall, dehiscing towards the upper leaf surface by an apical pore. Asci paraphysate, cylindrical to clavate, 60–70 μ × 15–18 μ. Spores mono- or distichous, ellipsoid, hyaline, one-celled, rounded at both ends, 13–14 μ × 7–8 μ.

41. **Phyllachora hieronymi** P. Henn.

Pilze Ostafr. apud. A. Engler, Die Pflanzenwelt-Ostafrikas, p. 34; Syll. Fung. XIV, p. 673.

On *Cyathea dregei*, Winters Kloof, Natal, 27.6.11, Doidge [1666].

Stromata epiphyllous, shiny black, often on the veins, slightly convex, 0·4–0·5 mm. diam., usually unilocular, penetrating right through the leaf. Clypeus epidermal, well developed, opaque, 30–33 μ thick. Locular wall brown, thin, 12–14 μ thick, often thinner at the sides. Loculus flat ellipsoid, 300–320 μ diam., 170 μ high. Asci paraphysate, clavate-cylindrical, briefly pedicellate, 65–70 μ × 16–20 μ. Spores distichous, hyaline, oblong, 20–24 μ × 7–8 μ.

42. **Phyllachora aberiae** P. Henn.

Engl. Bot. Jahrb., XLI (1908), p. 272 ; Syll. Fung. XXII, p. 411.

On *Doryalis caffra*, Driefontein, Zoutpansberg Dist., 12.8.11, Doidge [1813] ; Uitenhage, C.P., 31.5.12, Pienaar [2420] ; 17.10.06 [224].

Stromata epiphyllous, cellular, $\frac{3}{4}$–1 mm. broad, shiny, black, subrotund to irregular, slightly raised, showing on the under side of the leaf as minute raised points on the discoloured leaf tissue. Leaf normally 280 μ thick, hypertrophied in the region of the stroma, 400–500 μ thick. Clypeus epidermal epiphyllous, continuous, 25–34 μ thick. Loculi under the clypeus in the mesophyll, flask-shaped, or spherical with a wide neck, the base of the loculi being one-half or two-thirds of the distance through the thickness of the leaf ; surrounded by a brown, thick wall, which is 25–38 μ thick and formed of loosely interwoven hyphae ; usually opening towards upper leaf surface, occasionally towards the lower, when it is covered by a short hypophyllous epidermal clypeus ; occasionally two loculi on opposite sides of the leaf come into contact at their bases and are consequently flattened. Loculi 240–270 μ diam., or 250–280 μ high with a breadth of 200–220 μ. Between the necks of neighbouring loculi a loose hyphal stroma spreads inwards from the clypeus.

Asci ellipsoid, with monostichous, transverse, or partly distichous spores ; seldom cylindrical with distichous or imbricate monostichous spores, shortly pedicellate, foot usually 8–10 μ long, rarely 22–30 μ long ; asci 80–90 μ long and 12–20 μ broad, according to the arrangement of the spores, eight-spored, paraphysate. Paraphyses numerous. Spores cylindrical, rounded at both ends, 26–33 μ × $4\frac{1}{2}$–5 μ, hyaline, one-celled.

43. **Phyllachora amaniensis** P. Henn.

Engl. Bot. Jahrb. XXXVIII, 1905, p. 113 ; Syll. Fung. XXII, p. 420 ; Ann. Myc. XIII (1915), p. 473.

On leaves of *Ficus capensis*, Amanzimtoti, Natal, 19.3.14, Franks [7812] ; Barberton Dist., 16.10.13, V. d. Bijl [7378] ; Wyebank, Natal, 29.8.15, Doidge [9537].

This fungus was originally described on leaves of *Ficus* sp. collected at Amani, Usambara ; the South African specimens agree with the description in all important particulars, but the spores are slightly narrower, the spores of the type being 7–8 μ wide.

Stromata epiphyllous, scattered or loosely arranged in groups $\frac{1}{2}$–2 cm. diam., round or irregular, slightly raised, 1–1·5 mm. diam., dull black, not visible on upper surface, or showing as minute black pin-spots. Stroma originating in the lower part of the mesophyll, dividing the leaf into two very unequal portions, the lower narrower portion being pushed up by the developing stroma and forming an arch over it. Clypeus epidermal opaque, 25–35 μ thick. Loculi sub-spherical, less frequently flask-shaped, the narrowing in the latter case being due to crowding, deeply sunken in the leaf tissue, and occupying three-quarters or even more of the mesophyll. The base of the loculi usually rests on the palisade cells and the latter become filled with black, opaque stromatic tissue, which may or may not involve the upper epidermis. Loculi 240–400 μ diam., lateral walls delicate, 10–15 μ thick, consisting of light brown, rather thin-walled prosenchyma. Asci cylindrical with numerous paraphyses, 90–130 μ × 9–11 μ, straight or curved, eight-spored. Spores monostichous, ellipsoid, rounded at both ends, hyaline, continuous, 14–17 μ × 6–7 μ.

44. **Phyllachora Peltophori** Syd.

Ann. Myc. X (1912), p. 40 ; XIII (1915), p. 507.

On *Peltophorum africanum*, Ledzee, Zoutpansberg, 7.8.11, Doidge [1810].

Stromata on both surfaces of the pinnules, scattered or in groups, minute, about $\frac{1}{3}$ mm. diam., slightly convex, unilocular, smooth, shining. Loculi flattened, spherical, 200–250 μ diam., 160–180 μ high, covered above and below by the epidermal clypeus, which only extends a short distance beyond the loculi. Lateral locular wall weak or wanting. Asci clavate, paraphysate, 65–80 μ × 14–18 μ. Spores distichous, ellipsoid, hyaline, rounded, 13–17 μ × 6–8 μ.

45. **Phyllachora Lessertiae** n. sp.

On leaves of *Lessertia tenuifolia,* Smits Kraal, Boshof Dist., June, 1911, Burtt-Davy [1568].

Stromata amphigenous and petiolar, but mostly epiphyllous, scattered or crowded, minute, up to 0·5 mm. diam., somewhat raised, dull black, mostly unilocular. Stroma reduced to a clypeus above each loculus, 100–120 μ broad, and certain hyphal strands and knots under the clypeus and extending beyond it in the sub-epidermal cells. Loculi sub-spherical to pyriform, 169–190 μ diam., 200–240 μ high, occupying about one-third of thickness of leaf. Locular wall about 15 μ thick, consisting of delicate, compressed, colourless hyphae, broader near apex and darker coloured, fusing above with clypeus. Asci eight-spored, paraphysate, cylindrical or narrow-ellipsoid, with a very short foot, 80–90 μ × 12–16·5 μ. Periphyses present. Spores one-celled, hyaline, ellipsoid, rather thick-walled, obliquely monostichous or sub-distichous, 15–17 μ × 8·5–10 μ.

Phyllachora Lessertiae Doidge, nov. sp.

Stromata plerumque epiphylla, sparsa, minuta, usque ·5 mm. diam., vix vel leniter convexa, atra, clypeo epidermale, 100–120 μ lato, unilocularia. Loculi subglobosi v. pyriformi, 160–190 μ diam., 200–240 μ alti, parietibus circ. 15 μ crassis. Asci octospori, paraphysati, cylindracei, v. ellipsoidei, brevissime pedicellati, 80–90 μ × 12–16·5 μ. Sporae continuae, hyalinae, ellipsoideae, utrinque rotundatae, 15–17 μ × 8·5–10 μ.

46. **Phyllachorella rikatliensis** n. sp.

On leaves of *Andradia arborea,* Rikatli, P.E.A., September, 1918, Junod [11736].

Stromata minute, punctiform, about 0·3–0·5mm. diam., amphigenous, penetrating right through the leaf, scattered over greater part of leaf surface or in round irregular patches about 5 mm. diam., black shining, slightly convex. Epidermal clypeus on both sides of leaf, black, opaque, about 20 μ thick, only extending a small distance on each side of the loculi. Inner part of stroma of usual prosenchymatous structure; in this the loculi are embedded. Stroma may contain a single flattened spherical loculus, 240–250 μ diam., 140–150 μ high, or a single pycnidium of similar dimensions. Very frequently the flattened spherical loculus is about 300 μ diam. and has a small lenticular pycnidium cut off from one surface; exceptionally, there are two smaller loculi and a pycnidium, the shape of each being an irregular cone on a curved base. Locular wall about 10 μ thick.

Asci aparaphysate, clavate, eight-spored, 50–60 μ × 13–15 μ. Spores usually distichous, crowded in upper half of ascus, hyaline, one-celled, oblong, rounded at both ends, 10–13·5 μ × 3·5–5 μ.

Conidia brown, oblong, continuous, 13·5–15 μ × 6–7 μ.

Phyllachorella rikatliensis Doidge, nov. sp.

Stromata amphigena, minuta, circ. 0·3–0·5 mm. diam., atra, nitidula, leniter convexa. Loculi 1–3 in quoque stromate, sub-globosi v. compressi, 240–300 μ diam., 140–150 μ alti, clypeo atro, opaco, 20 μ crasso, parietibus 10 μ crassis. Asci aparaphysati, clavati, octospori, 50–60 μ × 13–15 μ. Sporae plerumque distichae, hyalinae, continuae, oblongae, utrinque rotundatae, 10–13·5 μ × 3·5–5 μ. Pycnidia loculis ascogenis similes, conidiis brunneis, oblongis, continuis 13·5–15 μ × 6–7 μ.

Hab. in foliis *Andradiae arboreae*, Rikatli, P.E.A., 1918, leg. Junod [11726].

47. **Endodothella natalensis** n. sp.

On leaves of *Dalbergia armata*, Winklespruit, Natal, 6.7.12, Doidge [2513]; Verulam, Natal, 3.7.13, Pole Evans [6809].

Stromata epiphyllous, minute, punctiform about 0·3 mm. diam. or becoming larger by confluence, somewhat convex, black shiny, showing on the under-surface only as minute, brown blisters, uni- or bilocular. Clypeus epidermal, dark brown, sub-opaque, ca. 15 μ thick, spreading to a diameter of about 500 μ. Loculi sub-spherical to lenticular, 240–320 μ diam. and 190–240 μ high, the base of the loculi being 30–45 μ from the lower surface of a leaf which is normally about 130 μ thick. Locular wall opaque, black, 13–16 μ thick, or somewhat lighter in colour and evidently prosenchymatous in structure. Loculi dehiscing by a apical pore opening towards upper side of leaf. In the bilocular stromata the space between the apices of the loculi is entirely filled with opaque, black, stromatal tissue. Asci paraphysate, eight-spored, ellipsoid or narrow cylindrical, straight or curved, 80–87 μ × 15–17 μ, with a short foot 6–7 μ long. Spores distichous or obliquely monostichous, hyaline, two-celled, not constricted, fusiform, 20–23 ·5 μ × 8 ·5–10 μ, wall about 1 ·5–2 μ thick, cells sub-equal, or upper cell 10 μ long, lower cell 13 ·5 μ long.

Endodothella natalensis Doidge, nov. sp.

Stromata epiphylla, minuta, rotundata, cir. 3 mm. diam. v. confluendi majores, leniter convexa, atra, nitidula. Loculi 1–2 in quoque stromati, sub-globosi v. globosi-depressi, 240–320 μ diam., 190–240 μ alti, totam fere folii crassitudinem occupantes, clypea, atro-brunneo, subopaco, ca. 15 μ crasso, 500 μ lato, parietibus opacis, atris, 13–16 μ crassis. Asci paraphysati, octospori, ellipsoidei v. cylindracei, recti v. curvati, 80–87 μ × 15–17 μ, pede breve 6–7 μ long. Sporae distichae v. oblique monostichae, hyaline, 1-septatae, haud constrictae, fusiformae, 20–23 ·5 μ × 8 ·5–10 μ, cellulis subaequalibus, v. supero 10 μ longo, infero 13 ·5 μ longo.

Hab. in foliis *Dalbergiae armatae*, Winklespruit, Natal, 6.7.12, leg. Doidge [2513].

48. **Endodothella strelitziae** (Cke.) Theiss. et Syd.

Ann. Myc. XIII (1915), p. 587.

Syn. *Dothidea strelitziae* Cke., Grevillea X., p. 120.

Phyllachora strelitziae Sacc., Syll. Fung. II., p. 606.

On leaves of *Strelitzia augusta*, Inanda, Natal, May, 1881, Medley Wood (Wood No. 580) [9468] and [10442]; Isipingo, Natal, 13.5.13, Doidge [6639]; Scottsburgh, Natal, 5.7.13, Pole Evans [6831]; Inanda, Natal, 13.9.13, V. d. Bijl [6958]; Kentani, 8.1.16, Pegler (Pegler No. 2384) [9422].

Stromata round, conical to hemispherical, 0 ·7–0 ·85 mm. diam., in groups of two to three, dull black, epiphyllous, unilocular, surrounded by a red brown zone in the leaf tissue; on the under side of the leaf only a wine-red discoloration is visible. The stroma fills the epidermis and the two sub-epidermal layers of elongated, flat cells, and raises these up to form an opaque clypeus, tearing them away from the adjacent layers of parenchyma. In the cavity thus formed the loculi are produced; they are covered by a clypeus formed from three layers of cells and about 100 μ thick; they are 650 μ diam. and 180 μ high; being separated at the base from the leaf parenchyma by a thin brown stromatic layer, the hyphae penetrating with the parenchyma in a more or less compact mass. Asci clavate, briefly pedicellate, paraphysate, 55–75 μ × 13–16 μ, eight-spored. Spores distichous, oblong or clavate, hyaline, septate somewhat above the middle, not or slightly constricted, 14–17 μ × 3–4 μ, upper cell shorter but broader, rounded, lower cell tapering somewhat.

49. **Oligostroma maculiformis** (Wint.) Doidge.

Syn. *Didymella maculiformis* Wint., Rab. Wint. Fung. Eur. 3056 (1884).

Oligostroma proteae Syd., Ann. Myc. XII (1914), p. 265; XIII (1915), p. 592.

On *Protea grandiflora*, near Capetown, June, 1884, MacOwan (Rab. Wint. Fung. Eur. 3056) [3396].

On *Protea flanagani*, Kentani, 17.7.12, Pegler, 5163. (This is the type collection of *Oligostroma proteae* Syd.)

On *Protea neriifolia*, Bains Kloof, near Wellington, 19.11.10, Doidge [1026]; 5.4.12, Stoneman [2231].

On *Protea* spp., Wellington, 10.6.11, Mally [1589]; without locality [943].

(?) Stroma not fully developed on *Protea* sp., Kentani, 19.10.12, Pegler [5618], and on *Protea abyssinica*, Diepkloof, near Dullstroom, 19.9.10, Doidge [931].

This fungus is very variable in its external appearance, but after careful comparison I think there can be no doubt that *Oligostroma protea* Syd. on *Protea flanagani* [5163] is identical with Winter's *Didymella maculiformis*. The variations mentioned in macroscopic characters are due to variations in the thickness of the cuticle of the host, rather than to any variations in the structure of the fungus.

Stromata amphigenous, forming discoloured, roughened areas on both sides of the leaf; these are usually irregular in outline and up to 10 mm. in diam. or larger by confluence; less frequently they are more or less circular and develop centrifugally. The stroma is reduced to an epidermal clypeus, 150–250 μ diam. over each loculus and the short scattered hyphal strands or knots under it. Sometimes the loculi are closely crowded and the clypeus over adjoining loculi becomes confluent, forming a more or less continuous stromal plate, or the loculi may be more scattered, solitary, or in twos and threes.

Loculi immersed, globose or ovate globose, 100–150 μ diam., locular wall consisting of small brown cells and fused at the apex with the epidermal clypeus. Asci sessile, cylindrical-clavate or clavate, 75–100 μ × 16–20 μ, rounded at the apex, aparaphysate, eight-spored. Spores distichous, oblong-cuneate, unequally uniseptate, not constricted, 24–28 μ long; upper loculus shorter, but more broadly rounded or ovate 8–10 μ long, 7–9 μ broad, lower loculus longer and narrower, 15–19 μ × 6–8 μ, hyaline or sub-hyaline.

50. **Ophiodothella edax** (B. and Br.) V. Höhn.

Fragm. XII No. 630 (1910).

Syn. *Dothidea edax* B. et Br., Journ. Linn. Soc., 1873, p. 135.

Ophiodothis edax Sacc., Syll. Fung. II, p. 653.

On leaves of *Tephrosia elongata*, Olifantsfontein, Pretoria Dist., 21.2.20, Pienaar [12822].

This fungus was originally described on leaves of *Tephrosia suberosa* from Ceylon. The South African specimen agrees with the description of the original, except in the size of spores. These are said to average 33–35 μ × 2·8–3·2 μ, but it is also stated that the asci are not quite ripe. It is probable, therefore, that the difference in the measurements of the spores is due to the fact that the present specimen is in a more mature condition.

Stromata minute, black, punctiform, formed in groups on large yellow leaf spots. There is an epidermal clypeus on both upper and under surfaces of the leaf, which is black, opaque, about 20 μ thick in the lower epidermis, 25–30 μ in the upper. There are 1–3 loculi in each stroma; these are flattened-spherical, 200–250 μ diam., 150–200 μ high, at base and apex united with the clypeus. The locular wall is 8–10 μ thick and consists of hyaline very much flattened cells. Asci numerous, aparaphysate, eight-spored, thin-walled, pedicellate, clavate-ellipsoid, 70–80 μ × 10–13 μ. Spores parallel, filiform, continuous, hyaline, straight or curved, thin-walled, cylindrical, somewhat attenuated towards the blunt ends, 45–60 μ × 3–3·3 μ.

THE GENUS BERSAMA.

By E. P. PHILLIPS, M.A., D.Sc., F.L.S., Botanist in Charge of the
National Herbarium.

THE genus *Bersama* was monographed by Mr. E. G. Baker in 1907 (Journ. Bot., XLV, p. 12), and two species, viz., *B. lucens*, Szyszl., and *B. tysoniana*, Oliv., were described from South Africa. From information received from the Union Forest Department, it was suspected that other species occurred in the South African forests, and, at the suggestion of the Chief of the Division of Botany, I undertook the examination of all the material in the local herbaria. This has led me to separate two plants as distinct species from specimens hitherto always called *B. tysoniana*.

The interest in the various species was first aroused by Mr. C. C. Robertson, M F., the Senior Research Forest Officer, who sent samples of the bark of *B. tysoniana* to the Imperial Institute for examination, as it was reported that the natives used the bark medicinally. The information supplied by Mr. Robertson to the Imperial Institute did not tally in some respects with the actual samples forwarded, and he took a good deal of trouble to clear up the matter. We are now in a position to state that the information Mr. Robertson received applied to a distinct species which I have named *B. Swinnyi*, while the bark supplied was that of *B. tysoniana*. Dr. T. R. Sim,* in his description of *B. tysoniana*, falls into the same error, as the tree referred to by Mr. Henkel as having " a very bitter bark, like quinine in taste," is not this species, but quite a distinct plant, which I have named *B. Stayneri*, so his remarks on *B. tysoniana* do not refer to this species alone. Sim suspected the Port St. Johns' plants to be an allied but distinct species, and I have been able to confirm this. It is the plant now named *B. Swinnyi*.

Mr. J. J. Kotze, B.Sc., of the Forest Department, who has given me every assistance in this work, allowed me to go through the files relating to the genus, and, having the actual specimens in the Forestry Herbarium, I was able to clear up some doubtful points. All the correspondence referred to plants which went under the name of *B. tysoniana* and the information was confusing until I was able to definitely recognize that three distinct species were involved. The information derived from the above source I have tabulated under the specific names.

B. tysoniana.

The Conservator of Forests, Transkeian Conservancy, states: " Trees are scattered singly, fairly plentifully over most of the mountain forests and where accessible. It is a prolific seeder, and I am of opinion that it could be easily propagated artificially under mountain forest conditions in its habitat. In collecting the bark, natives do not cut down the whole tree, but merely take their requirements from time to time from living trees. I can confirm the statement: it is a well-known fact that local natives use the bark medicinally." (Stated that native doctors use the bark as a specific against fevers.—(*E. P. P.*)

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* Sim, " Forest Flora, Cape Colony," p. 175.

A sample of bark was collected by Forester Van de Vijver from the Ngadu Patrol, and he writes: "This bark is used as medicine by some natives, but not all. In cases of calves being thin, they dose the animal with it powdered and mixed with other roots, also lambs." Forester Dawson submitted a sample of bark from the Amanzamnyama Patrol, with the note: "Bark has a slightly bitter taste. I have only seen one tree in my patrol and very few natives know it here. They do not seem to use it themselves, but on their cattle for gall-sickness after boiling bark and dosing from one to two bottles." Forester Fegen collected samples of bark from the Notinsela Patrol, and reported: "Bark has a slightly bitter taste. Natives state that the bark is used as a medicine for hysteria, which is common amongst the native girls. Other natives state that it is used indiscriminately for both cattle and human beings. Judging by the number of trees barked, it must be used more extensively for medicine than natives will admit."

Forester Kriel, who collected the species in the Wilo Forest, Mqanduli District, reports it to be a tree about 25 ft. high with a girth of 42 in.

The tree is locally known as "Bitter Bark" and "Bastard Sneezewood" and by the natives as "Endiaza" or "Andianda."

B. Swinnyi.

Forester Swinny reports this species to be a tree up to 90 ft. high, with a stem diameter of 2–3 ft., and not common at Port St. Johns. He further states that there appears to be two forms of the species which the natives distinguish, though they have only one name, "Sendiandia." The smaller form, when full grown, has a trunk 1–1½ ft. in diameter.

Mr. Robertson first detected the difference in the barks of this species and *B. tysoniana*, and noted that the bark had "a strong bitter taste producing a sort of burning sensation in the mouth lasting for several hours, during which I could taste nothing else distinctly." He forwarded a sample of the bark to the Imperial Institute in March, 1915. Mr. Ross, then Conservator in the Eastern Conservancy, writes:* "I distinctly remember this tree being pointed out to me many years ago when stationed at Kokstad as being of value medicinally, an infusion of the bark being extensively used by the natives for certain ailments. It is found somewhat sparingly throughout the mid-Pondoland forests and close to the Natal border in the Mount Ayliff District. It is a very conspicuous object in the forests, of large girth, with deeply furrowed bark, and with foliage not unlike sneezewood. It is usually unsound near the base and shows signs of much damage by removal of bark. This tree is by some foresters confused with 'Coffee Pear' (*Pleurostylia capensis*), but a keen observer will easily distinguish a great difference."

Forester Pretorius collected samples of bark from the Cwebe Patrol and supplied the following information:—"Bark has a slightly bitter taste (Mr. Robertson remarks 'but burning taste'). The bark of this tree in these parts is very thin and can only be removed in small bits. The natives use it for different medicines, but they refuse to say what it is really used for." Specimens of bark from the Port St. Johns Patrol were received with similar information to the above; in each case Mr. Robertson noted the burning taste, more so in some specimens than in others.

B. Stayneri.

This species was sent to Mr. Robertson by Forester C. W. Chilvers in June, 1915. Mr. Robertson noted the differences between these specimens and *B. tysoniana* as follows:—

1. Bark has not got the "strong bitter taste" which I referred to in the case of one of the specimens from the Transkei (i.e. *B. Swynni E.P.P.*).
2. Under sides of the leaves and the petioles are very hairy, whereas they are glabrous on specimens received from the Transkei.
3. The specimens were in flower when collected in May. Sim states that this species † flowers in August to September.

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* It is just possible that some of Mr. Ross's remarks may apply to *B. tysoniana*.

† Mr. Robertson, although he noted these differences, still considered the plant *B. tysoniana*.

Mr. C. F. Stayner, in a minute to the Conservator of Forests, Pietermaritzburg, states: "One large tree isolated by heavy fellings was in flower as late as September, and I have come to the conclusion that this species (but he confused his specimen with *B. tysoniana E.P.P.*) is inconsistent in its period of blossoming. I find that *Bersama* is well known to native herbalists and is frequently employed, but for what disease it is a specific I cannot ascertain." Mr. Stayner submitted his specimen to the Bolus Herbarium, and these were reported on as follows:—"Very nearly allied to *B. tysoniana*, Oliv., and probably that species, but the type of *B. tysoniana* has more slender, longer, and less tomentose petioles."

Mr. J. S. Henkel, who also collected the species at Mkazeni Forest Reserve, Riverside, Natal, in March, 1917, states "that the tree is about 30 ft. high—a bole about 70 in. in girth and 12 ft. long, somewhat crooked. Natives use the bark as medicine and the tree has been injured by the removal of bark. Bark has a bitter quinine-like taste." Mr. Henkel also noted that the leaves were hairy, and not glabrous. Forester Honshold informs Mr. Henkel that in the reserve there are about three to four other trees, all smaller than the one he saw. In the bush many seedlings were noticed up to about 4 ft. high. The young shoots are frequently reddish in colour and leaves serrated and mucronulate, but older leaves have margins entire.

Mr. Robertson took considerable pains to sift all the evidence he had accumulated, and tabulated his results * as follows:—

Mr. Robertson distinguished the various samples of bark he examined as (1) those with a bitter taste and (2) those with a bitter *and burning* taste. This latter property he referred to as "X."

Forest.	Large or Small Variety.	Sample of Bark.	Taste.	Remarks.
MOUNTAIN FORESTS.				
Kambi.........	Presumably the large variety	Sent June, 1914, and February, 1915	Not X........	*B. tysoniana*, sent to Imperial Institute.
Nqadu..........	Large.........	Collected March, 1915..	Not X........	*B. tysoniana.*†
Amanzamnyama.	Large.........	Collected March, 1915..	Not X........	*B. tysoniana.*
COAST FORESTS.				
Port St. Johns..	Large.........	Sent July, 1914........	Has X........	*B. Swinnyi.*
Bulolo Forest...	Large.........	Collected March, 1915..	Has X, though not strongly	*B. Swinnyi.*
Mboleni Forest..	Large.........	Collected March, 1915..	Not X........	*B. tysoniana.*
Cwebe Forest...	Large.........	Collected March, 1915..	Has X, though not strongly	*B. Swinnyi.*
Cwebe Forest...	Small..........	Collected March, 1915..	Has X, though not strongly	*B. Swinnyi.*
Port St. Johns..	Small..........	Sent July, 1914........	Has X........	*B. Swinnyi.*
Bulolo Forest...	Small..........	Collected March, 1915..	Has X........	*B. Swinnyi.*†

Mr. Robertson came to the following conclusions:—

1. In mountain forests the large variety (i.e. *B. tysoniana E.P.P.*) has not "X." Yet the natives do use the bark in these forests, so that its medicinal qualities do not depend on its having "X." It appears that only the large variety is found in the mountain forests.

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[*] In the "Remarks" column I have inserted the name of the species which was given in the original by a herbarium number only.

[†] I have not seen specimens of these, but do not doubt the correctness of the names given.—(*E. P. P.*)

2. In the coast forests the large variety* usually has "X" to a greater or less extent, but apparently not so strongly as the small variety (*B. Swinnyi E.P.P.*). The latter always has it and usually very strong.

The results of my investigation may be summarized as follows :—

1. Foresters had hitherto only recognized two species, viz., *B. lucens* and *B. tysoniana.*
2. Under the name of *B. tysoniana,* three species have been included—
    - (*a*) *B. tysoniana,* found in both the mountain and coast forests.
    - (*b*) *B. Swinnyi,* found only in the coast forests.
    - (*c*) *B. Stayneri,* only recorded from Natal.
3. The bark of *B. tysoniana, B. Swinnyi,* and *B. Stayneri* is used medicinally by the natives.
4. The bark of *B. Swinnyi* has a bitter *burning* taste and differs in this respect from that of *B. tysoniana* and *B. Stayneri,* in which the bark, while bitter, has not the burning taste.
5. There appear to be two forms of *B. Swinnyi* in the forest of Port St. Johns, known to the foresters as the large and small varieties. The natives are said also to distinguish these, but have the same name for both.

I have been unable to furnish any additional information with regard to the other species recorded.

In conclusion I should like to refer again to Mr. C. C. Robertson's share of this work. Since 1914 he has been slowly accumulating evidence from foresters about the species, and my remarks are only a digest of the information he collected.

With the assistance of the Forest Department, the Division of Botany is undertaking an examination of the barks of the various species as regards their medicinal value.

KEY TO SPECIES.

Inflorescence quite sessile, ovoid or globose, surrounded at the base by numerous large ovate acuminate silky bracts.......................... *Swinnyi.*

Inflorescence distinctly peduncled, rarely sub-sessile, but then bracts at the base never densely silky.

Mid-rib on lower surface of leaflets covered with long straight hairs. *Stayneri.*

Mid-rib on lower surface of leaflets glabrous.

Fruits without woody protuberances ; inflorescence silky or tomentose with fine adpressed hairs.

Leaves usually 2–3-jugate ; leaflets obovate, usually rounded at the apex, obtuse...................... *lucens.*

Leaves usually 4-jugate ; leaflet oblong-lanceolate, acuminate, acute............................. *abyssinica.*

Fruits with woody protuberances ; inflorescence tomentose with spreading hairs appearing almost shaggy................. *tysoniana.*

1. **B. Swinnyi,** Phillips.

Arbor. *Rami* glabri vel juniores serici. *Folia* 10–20 cm. longa, pinnata, 5-jugata ; foliola 2–8 cm. longa, 0·9–3·5 cm. lata, oblongo-lanceolata, ovato-oblonga vel ovata, apice obtusa, glabra. *Racemus* sessilis, 2·5–5 cm. longus, circa 3 cm. latus, subglobous vel ovatus. *Bracteae* numerosae, 2 cm. longae, ovatae, acuminatae, sericae.

A large or small tree, with rough bark. *Branches* glabrous or in very young branches velvety. *Leaves* 10–20 cm. long, grouped at the ends of the branches, petiolate, pinnately compound, 5-jugate ; petiole 2·5–3·5 cm. long, pubescent in young leaves, glabrous in older leaves ; leaflets petioulate, 2–8 cm. long, 0·9–3·5 cm. broad, oblong-lanceolate or ovate-oblong, or ovate, obtuse or slightly retuse at the apex, rounded at the base, with the mid-rib prominent beneath and the lateral veins distinct, glabrous. *Inflorescence* sessile, 2·5–5 cm. long, about 3 cm. in diameter, subglobose or ovoid in shape, surrounded at the base with numerous ovate acuminate densely silky bracts about 2 cm. long. *Floral-bract* 7 mm. long, ovate, acuminate, very densely silky. *Pedicel* about 4 cm. long, terete, silky. *Sepals* 6 mm. long, ovate, acute, distinctly keeled, silky. *Petals* 1·3 cm. long, about 3 mm. broad at the middle, spathulate-linear, tomentose without, sometimes with two marginal processes at the middle. *Stamens* monadelphous; filaments terete and narrowing above, flattened below and hairy on the flattened portion. *Ovary* 1·5 mm. long, sub-globose, villous; style 1·3 cm. long, terete and densely villous in the lower $\frac{3}{4}$ becoming more or less four-angled and glabrous above; stigma globose. *Fruit* not seen.

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* Mr. Robertson here confuses *B. tysoniana* and *B. Swinnyi,* both of which occur in the coast forests.—(*E. P. P.*)

Pondoland: In monte propoxe ostium flum St. Johns R., c. 1000 ft., February, *Bolus* 8724; 20 ft., January, *Flanagan* 2884; Port St. Johns, *Swinny in Herb. Forest Dept.*, 1038, 1037; Pongwani Forest, Port St. Johns, January, *Coetzee in Herb. Forest Dept.*, 1866.

2. **B. Stayneri** Phillips.

Rami glabri. *Folia* pinnata, 7–16 cm. longa, 4–5-jugata; petiolus pilosus; folioal 1·7–5·2 cm. longa, 0·8–1·5 cm. lata, oblongo-lanceolata vel elliptica, apice acuta mucronataque, basi paullo cuneata, subtus pilosa vel pubescentia. *Racemus* 3·5–6·5 cm. longus. *Fructus* 2·7–3 cm. longus, ligneus.

Bark thick and rough. *Branches* glabrous, rough with longitudinal furrows. *Leaves* pinnate, petioled, 7–16 cm. long, 4–5-jugate; petiole 1–2 cm. long, very densely pilose; rachis densely pilose; leaflets 1·7–5·2 cm. long, 0·8–1·5 cm. broad, oblong-lanceolate or elliptic, acute and mucronate at the apex rarely rounded, slightly cuneate at the base, the mid-rib deeply sunk on the under surface which is frequently somewhat rugose, prominent beneath and with the lateral veins distinct beneath, glabrous above, pilose or pubescent beneath, especially on the mid-rib. *Inflorescence* a shortly peduncled many-flowered raceme, 3·5–6·5 cm. long; peduncle 1–1·5 cm. long, very densely pilose. *Bracts* 3 mm. long, linear, tomentose, *Pedicels* 5 mm. long, terete, tomentose. *Calyx* 6 mm. long, densely tomentose, divided almost to the base. *Petals* 1·3 cm. long, 3 mm. broad, spathulate-linear, tomentose, reflexed in open flowers. *Filaments* 5 mm. long, semiterete, monadelphous and villous at the base. *Ovary* densely villous; style 3 mm. long, terete; stigma subglobose. *Fruit* 2·7–3 cm. long dehiscing by four valves; valves woody, covered with woody protuberances. *Seeds* reddish in colour, 1·1 cm. long, 6 mm. in diameter, ellipsoid, with a waxy yellow arillus at the base.

Natal, without locality, *Stayner in Herb. Bolus;* Stinkwood Forest, Ingeli, May, *Chilvers in Herb. Forest Dept.*, 1518; Mkanzeni, Riversides, *Henkel in Herb. Forest Dept.*, 2421.

3. **B. lucens** Szysz.

A shrub 8–10 ft. high (ex *Wood*). *Branches* glabrous, with wrinkled greyish bark. *Leaves* petioled, compound, imparipinnate, 2–4-jugate, 10–20 cm. long; petiole 1·5–5·5 cm. long, glabrous, rarely pubescent; leaflets 1·8–9 cm. long, 1·3–4·6 cm. broad, obovate or obovate-elliptic, rarely elliptic, very rarely subacute, slightly narrowed at the base, glabrous, with the mid-rib distinct above, prominent beneath, and with thickened wavy margins. *Inflorescence* a lax axillary or terminal raceme, 6–14·5 cm. long, many-flowered; peduncle pubescent. *Pedicels* 0·4–1 cm. long, terete, densely tomentose with fine adpressed hairs; bracts 0·5 mm. long, ovate, pubescent. *Calyx* gamosepalous; lobes 3–4 mm. long, 2 mm. broad, ovate or ovate-elliptic, obtuse, finely but densely pubescent without and with fine adpressed hairs within, ciliated, the two posterior lobes connate and bifid at the apex. *Petals* dull yellow, 8·5 mm. long, 2·5 mm. broad above, oblong, obtuse, narrowed into an evident claw, pubescent. *Disc* unilateral. *Filaments* all connate at the base, 1 mm. long, terete, glabrous except at the base, the anterior filaments ciliated at the base and forming a tomentose shield 3 mm. long and 2·5 mm. broad; the posterior filaments ciliated and pubescent at the base; anthers 2·5 mm. long, 1·5 mm. broad, oblong. *Ovary* 1 mm. long, 1·5 mm. broad, subglobose, densely villous, four-locular with a single ovule in each loculus; style 7 mm. long, cylindric, pubescent on the lower half; stigma globose, faintly lobed. *Fruit* 1·7 cm. long, 1·7 cm. in diameter, finely but densely pubescent, four-celled, each cell with a single seed, splitting into four valves when ripe. *Seeds* bright scarlet, 7 mm. long, 7 mm. in diameter, subglobose, wrinkled, flat on one side, convex on the other, with a fleshy yellow-green arillus. *Wood, Natal Plants*, 88; *Sim, Forests and Forest Flora*, 155; *Journ. Bot.*, XLV, *p.* 13. *Natalia lucens, Hochst., Harv. and Sond., Fl. Cap.*, 1, 369.

Komgha Div., Kei Mouth, 200 ft., August, *Flanagan*, 421; Transkei, Kentani, 20 ft., December, *Miss Pegler*, 726; Pondoland, mouth of St. Johns River, *February, Bolus*, 8836; *Flanagan*, 2568; 20 ft., January, Manino Forest, Engcobo Dist., August (leaf only). *Zahn in Herb., Forest Dept.*, 2046; *Natal*, near Durban, 200 ft., February, *Wood*, 7392; March, *Wood*, 7518; Verulam, 100–200 ft., January, *Wood*, 10207; near Durban, *Wood*, 2570; 12666; Port Natal, *Gueinzuis*; Groenberg, February, *Wood*, 808; without precise locality, *Saunders ;* near, Durban, 200–300 ft., March, *Wood*, 6307; Swaziland, kloof near Dalriach Mbabane, c. 4800 ft., December, *Bolus ; Transvaal*, Barberton Dist., Unevoti Creek, Barberton, 3000 ft., February, *Galpin*, 849; *Thorncroft in Herb. Transvaal Mus.*, 18292.

Flanagan, 421, mentioned by Baker as a form with smaller leaflets than the type is slightly confusing, inasmuch as Flanagan gave the same number to two different collectings. His No. 421 in the Bolus Herb. was collected at the Kei Mouth at an altitude of 200 ft. in August, 1894, and is the true *B. lucens*. His No. 421 in the Cape Government Herb. was also collected near the Kei Mouth at an altitude of 300 ft., but in January, 1890. The inflorescence in these specimens is compact, oblong in outline, and at the end of a long naked peduncle 9–12 cm. long. The peduncle is fasciated to a slight extent, which will account for the compact inflorescence. There is no difference in the floral structures of these specimens and other specimens of *B. lucens* which I have examined.

4. **B. abyssinica** Fresen.

A tree. *Leaves* petioled, 18–22 cm. long, pinnate; petiole 4–5 cm. long, terete, glabrous; rachis sometimes winged between the uppermost pair of leaflets; leaflets usually in four pairs, 2·5–4 cm. apart, 4–9 cm. long, 1·7–3·5 cm. broad, oblong-lanceolate or ovate-lanceolate, acuminate, acute, entire, or the margin sometimes serrated in the upper half, glabrous. *Inflorescence* racemose, 10–20 cm. long, on a woody peduncle 5–7 cm. long. *Calyx* campanulate, silky. *Petals* five, ligulate-spathulate, twice as long as the calyx, densely and finely silky, finally reflexed. *Stamens* five, in the male flower nearly as long as the petals; filaments monadelphous, silky. *Capsule* about 1 cm. long, 1 cm. in diameter, subglobose 3–4 valved, densely pubescent, without woody protuberances. *Seeds* 6 mm. long, black.

This description was drawn up partly from a fruiting specimen collected by Schimper in Abyssinia and partly from the description in the "Flora Tropical Africa."

Baker, in his monograph on the genus (Journ. Bot., XLV, 12), makes no mention of this species occurring in Natal, though the record is made in the "Flora Tropical Africa," I, 434.

= *B. integrifolia*, Richard, Fl. Abyss., I, 107. This is a tropical African species.

5. **B. tysoniana** Oliv.

A tree 25 ft. high, with a girth of 42 in. (Krid). *Branches* glabrous. *Leaves* petioled, pinnately compound, 4–5-jugate, rarely 3-jugate, 5–20 cm. long; petiole 2–5 cm. long, subtomentose, pubescent to almost glabrous, sometimes white silky; leaflets 1·5–6 cm. long, 0·7–3 cm. broad, oblanceolate, oblong, oblong-elliptic, rarely obovate, rounded or shorty apiculate at the apex, cuneate more rarely rounded at the base, entire, rarely serrated in the upper half, with the mid-rib prominent beneath, glabrous. *Inflorescence* a dense raceme, distinctly peduncled or subsessile, 6–17 cm. long, cylindric. *Peduncle* usually 1–3·5 cm. long, tomentose with spreading hairs. *Pedicels* 3 mm. long, tomentose with spreading hairs. *Sepals* 5–7 mm. long, 3 mm. broad, ovate, concave, acute or obtuse, tomentose with spreading hairs, two of the sepals united. *Petals* white 1·1–1·5 cm. long, 2 mm. broad, oblong, linear-oblong or linear, narrowing sometimes into a linear claw below, subostuse or acute, villous. *Filaments* 0·8–1·2 cm. long, terete and glabrous in the upper half, expanded villous and monadelphous in the lower half; anthers 1·5 mm. long, oblong in outline. *Ovary* densely villous; style 8 mm. long, densely villous below, glabrous or almost so above; stigma subglobose or globose. *Fruit* 2·2 cm. long, about 2·2 cm. in diameter, subglobose; the valves covered with woody protuberances. *Seed* 1·2 cm. long, about 6 mm. in diameter, more or less keeled on one face, convex on the other, reddish with a yellow arillus at the base.

Komgha Div., Komgha, on Alan Page's farm "Goldust," May (in leaf only), *Galpin*, 8470; Prospect, near Komgha, September, *Flanagan*, 309; Instsubani Forest, February (fruit), *Leigh in Herb. Forest Dept.*, 1840; Wilo Forest, Mqanduli Dist., *Kriel in Herb. Forest Dept.*, 1772; Mboleni Forest, Notineela, October, *Fegen in Herb. Forest Dept.*, 1771; Manina Forest, Engcobo Dist., August, *Zahn in Herb. Forest Dept.*, 2047 (leaf); Cwebe Forest, January (fruit), *Pretorius in Herb. Forest Dept.*, 1854.

Gerrard 1428 *from Natal.* Description of branches and leaves by Baker in Journ. Bot., Jan., 1907, p. 15.

Arbor vel frutex? Ramulis cortice griseo tectis; foliis saepissime 4-jugis cum impari petiolulato, foliolis petiolulatis oblongis apice apiculatis lateralibus aliquantulum inaequilateraeibus oppositis vel passim alternis basi cuneatis vel interdum rotundatis coriaceis margine integris vel plus minus serratis costa superne impressa subtus subconspicua nerviis secundariis tenuibus inter se juxta marginem anastomosantibus foliolis terminalibus oblongo-oblanceolatis foliolis proximis quam distalibus minoribus; rachi omnino exalata.

I have seen a specimen in leaf only (*Zahn in Herb. Forest Dept.*, 2037) which agrees with the above description, except that the leaves are 6-jugate. The leaflets which appear to be young have a long hairy apiculus, and are either entire or serrated in the upper half. In *Tyson*, 6216, in the Bolus Herb. on which Oliver founded his *B. tysoniana*, I find that some of the leaflets have this hairy apiculus and some are also toothed, so that it would appear that Baker is correct in regarding *Gerrard*, 1428, as near *B. tysoniana*, and I am of opinion that it is this species. The distribution of *B. tysoniana* suggests that it will probably be found in Natal.

A REVISION OF THE AFRICAN SPECIES OF SESBANIA.

By E. P. PHILLIPS, Division of Botany, Pretoria, and J. HUTCHINSON (Kew).

THE present paper is an attempt to revise the African species of the genus *Sesbania*, family *Papilionaceae*. Imperfect as it may prove to be, it is long overdue, chiefly because of the great accumulation of herbarium material since the publication of the second volume of the "Flora of Tropical Africa" in 1871, much of this material having remained unnamed or imperfectly determined. The results of this investigation might very well have been more satisfactory to the authors had there been more field notes available regarding the situation, habit, floral colouring, etc., of the specimens accumulated in the various herbaria which they have been able to consult.[*] That this information is vital in the determination and limitation of the species of *Sesbania*, at least, has been well demonstrated by Prain[†] in his critical elucidation of the Indian species.

The genus *Sesbania* contains about fifty species which occur in the warmer parts of the world, mainly in or by the sides of streams, lakes, and swamps. It appears to attain its greatest development in tropical Africa, a few of the species extending into South Africa as far as Natal, and into various parts of the Transvaal and Bechuanaland. In the present revision of the species from this area twenty-three are recognized to be distinct. They belong to two sections, nineteen to *Eusesbania* and four to *Daubentonia*, the latter characterized by its four-winged fruits. The third and purely American section into which *Sesbania* was divided by Bentham and Hooker (Gen. Pl., I, 502) is now recognized by American botanists[‡] as a distinct genus, *Glottidium*, and the present authors' views coincide in respect to this. They cannot, however, go so far as to accept the American view regarding the generic status of *Daubentonia* which occurs in the three widely separated areas, namely, the south-eastern United States and Mexico, sub-tropical South America, and tropical East Africa. This broken distribution seems to point to a separate origin of the species of *Daubentonia* from the basal stock, *Eusesbania*, species of which occur in all these areas. *Glottidium*, on the other hand, a native of Florida, is well separated from *Sesbania* by its short fruits with only two seeds and the manner of dehiscence, the seeds remaining inside the dry bladder-like endocarp which detaches itself as a whole from the outer shell.

In the case of the African species we have found a most useful and constant character in the nature of the appendages on the claw of the vexillum. In the first five species shown in the key these are long and quite free from the vexillum in their upper half. In all the other species they are sessile and adnate to the claw, whilst they are not perceptible in one species, *S. leptocarpa*. These appendages on the claw of the vexillum in *Sesbania* are probably closely connected with pollination, and no doubt, as in some other *Leguminosae*, their function is to clasp and lift open the free stamen in order to give insects ready access to the nectaries.

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[†] Prain in Journ. Anat. Soc., Bengal, LXVI, 366–370 (1897).

[‡] Small, Fl. South-Eastern Unit. States, Ed. II, 615 (1913).

We have considered it sufficient to restrict ourselves in regard to synonymy to those names to which have been applied to the African species.

KEY TO THE AFRICAN SPECIES OF *SESBANIA*.

I. Eusesbania.—*Fruits not winged on the margins of the valves* (*in* S. sphaerocarpa *fruits acutely keeled down the middle of the valves*).

Appendages of claw of vexillum free in their upper half or third:
Vexillum yellow, plain or finely speckled on the back with dark spots:
Stems and leaves rather densely villous pubescent:
Flowers solitary or in pairs; leaflets 5–10 pairs, stipules deciduous; appendages to vexillum obtuse........ 1. *S. Goetzei.*
Flowers several in each inflorescence; leaflets more than 10 pairs; stipules persistent; appendages to vexillum acutely acuminate...................... 2. *S. speciosa.*
Stems and leaves glabrous or nearly so:
Inflorescence branched; peduncles smooth; West African species................................. 3. *S. punctata.*
Inflorescence not branched:
Peduncles smooth............................ 4. *S. aegyptiaca.*
Peduncles aculeate........................... 5. *S. Dummeri.*
Vexillum and tips of wings suffused throughout with dark purple... 4. *S. aegyptiaca* var. *bicolor.*

Appendages of vexillum wholly adnate to the claw or absent:
Flowers very large, 5–10 cm. long: fruits about 30 cm. long; leaflets 3–3·5 cm. long; cultivated species............... 6. *S. grandiflora.*
Stipules foliaceous, broad, about 1 cm. long, more or less persistent:
Peduncles smooth:
Flowers pale blue, not speckled..................... 7. *S. caerulescens.*
Flowers yellow, vexillum speckled.................. 8. *S. cineresens.*
Peduncles strongly aculeate.......................... 9. *S. macrantha.*
Stipules more or less subulate, never foliaceous, and mostly soon falling off:
Stems and leaves or leaves only rather densely pubescent:
Calyx glabrous outside:
Pod not torulose............................. 10. *S. pubescens.*
Pod strongly torulose.......................... 11. *S. Dalzielii.*
Calyx pubescent outside............................ 12. *S. Wildemannii.*
Stems and leaves glabrous or only slightly pubescent:
Leaflets usually well over 1 cm. long; leaves nearly always as long or longer than the inflorescence:
Valves of the fruit not keeled down the middle:
Appendages absent from the claw of the vexillum; fruits torulose, much constricted between the seeds................................ 13. *S. leptocarpa.*

Appendages present on the claw of the vexillum :
Margins of the fruits straight :
Fruits about 7 mm. broad ; seeds separated by partitions of the endocarp ; stems and leaf-rachis never aculeate .... 14. *S. pachycarpa.*
Fruits 3 mm. thick, seeds not separated ; stems and leaf-rachis often aculeate.... 15. *S. aculeata.*
Margins of fruits much constricted between the seeds.................................... 16. *S. arabica.*
Valves of the fruits sharply keeled on the back, Angolan, species................................ 17. *S. sphaerocarpa.*
Leaflets very small, averaging about 5 mm. long ; leaves much shorter than the inflorescence :
Vexillum mottled with purple spots.............. 18. *S. microphylla.*
Vexillum striate, not mottled..................... 19. *S. mossambicensis.*

II. **Daubentonia.**—*Fruits broadly winged on the margins of the valves ; peduncles aculeate towards the base.*

Stems not aculeate ; peduncles aculeate only near the base :
Leaves much shorter than the fruits ; inflorescence very few (1–3) flowers ; N.E. Tropical Africa.............. 20. *S. tetraptera.*
Leaves much longer than the fruits ; inflorescence several flowered ; Zambezi basin............................... 21. *S. Kirkii.*
Stems aculeate :
Leaflets about 18 pairs ; inflorescence up to 11 cm. long ; staminal sheath shorter than the free parts of the filaments.. 22. *S. hamata.*
Leaflets about 10 pairs or less ; inflorescence 1–3 flowered, very short ; staminal sheath longer than the free part of the filaments.................................. 23. *S. Rogersii.*

EUSESBANIA.

1. **Sesbania Goetzei,** *Harms.*, in Engl. Bot. Jahrb., XXX, 327 (1902).

A shrub 2–3 m. high, branchlets rather densely and softly grey-pubescent, the older ones becoming striate or somewhat angular. *Leaves* shorter than the inflorescence, 3–5 cm. long ; rachis and leaflets densely and softly grey-pubescent ; leaflets about 6–10 pairs, shortly stalked, oblong, rounded and unequal-sided at the base, rounded and very minutely mucronate at the apex, 1–1·5 cm. long, 3–6 mm. broad ; stipules soon falling off, triangular-lanceolate, acute, 3–4 mm. long, pubescent ; stipules minute. *Inflorescence* mostly two-flowered, axillary ; peduncle softly pubescent ; pedicels about 5 mm. long, with two linear-lanceolate fugacious bracteoles towards the apex. *Flower buds* ellipsoid, turbinate at the base, subacute at the apex. *Calyx* widely campanulate, abruptly contracted into a solid turbinate base, about 5 mm. long, with five acute subulate-triangular lobes scarcely 1·5 mm. long, sparsely pubescent outside. *Vexillum* large, orbicular, about 3 cm. long and broad, strongly and closely mottled with purple, with two free linear curved obtuse appendages towards the base about 7 mm. long. *Alae* about 2·5 cm. long and 8 mm. broad. *Carina* 3 mm. long, the claw slightly longer than the broadly boat-shaped limb. *Staminal-sheath* 2 cm. long, free parts of filaments curved upwards and about 8 mm. long. *Ovary* with a very thin line of hairs along the top ; style glabrous. *Fruits* not known.

Tropical Africa : Tanganyika Territory, Ubungu, Rukwa Lake, moist banks, 800 m., July, *W. Goetze*, 1115 (type). British East Africa, between Kikuyu and Eldama Ravine, 1898, *A. Whyte ;* Eldama Ravine, *A. Whyte.*

A very beautiful species with short leaves, few hairy leaflets, large handsome flowers, the standard petals densely mottled with purple.

2. **Sesbania speciosa,** *Taub.*, *ex* Engl. in Abh. Preuss. Akad. Wiss., 1894, 21, 42, et in Engl. Pflanzenw. Ost-Afr. C. 213 (1895); *S. Hildebrantii* Taub., *l.c.*

Branchlets flexuose, obtusely angular, shortly pubescent. *Leaves* about as long as the inflorescence up to 15 cm. long; rachis and leaflets on both sides fairly densely pubescent; leaflets about 15 pairs, stalked, narrowly oblong, slightly narrowed and almost equal-sided at the base, acutely mucronate at the apex, 2–2·5 cm. long, 6–8 mm. broad; stipules persistent, obliquely lanceolate, very acutely acuminate, 1–1·3 cm. long, about 4 mm. broad at the base, adpressed-pubescent on both sides; stipels minute. *Inflorescence* 6–10 flowered, axillary; peduncle stout towards the base, pubescent; pedicels about 1·5 cm. long, nearly glabrous; bracts persistent, linear, about 6 mm. long, pubescent, margins membranous towards the base; bracteoles deciduous. *Flower buds* not seen. *Calyx* widely campanulate from an acute turbinate base, about 8 mm. long, with five subulate acute teeth about 1·5 mm. long, glabrous outside. *Vexillum* (probably yellow) finely mottled with purple, rather broadly elliptic, shortly clawed, 3 cm. long, 2 cm. broad, with two linear free appendages at the base. *Alae* 3·5 cm. long, 8 mm. broad. *Carina* 3 cm. long, the boat-shaped limb a little longer than the claw. *Staminal-sheath* 2·5 cm. long. *Ovary* slightly hairy. *Fruit* up to nearly 33 cm. long, about 8 mm. broad, rather thick, with undulate edges, nearly glabrous. *Seeds* somewhat kidney-shaped, dark brown.

TROPICAL AFRICA: East African Protectorate, Usambara; Maschena, in meadows, July, 1893, *C. Holst*, 3508; banks of the Kingani, 6 ft. high, fl. and fr., *Hildebrandt*, 960 (Herb. Mus. Brit.).

3. **Sesbania punctata** D.C. Prodr., ii, 265 (1825); Baker in Oliv. Fl. Trop. Afr., ii, 133 (1871), partly.

A shrub or slender tree, growing on banks of streams; branches pale straw-coloured when dry, slightly flexuous, sometimes slightly muricate below the leaves, otherwise glabrous. *Leaves* shorter than the inflorescence, 7–10 cm. long; rachis pubescent on the upper side, soon becoming nearly glabrous, not prickly; leaflets 12–22 pairs, shortly stalked, oblong-linear, a little narrowed and sub-equal-sided at the base, shortly and acutely mucronate at the apex, 1·2–2 cm. long, 3–5 mm. broad, glabrous or slightly pubescent on the thickened mid-rib and margins, stipules deciduous, recurved, about 3 mm. long, slightly pubescent; stipels very minute. *Inflorescence* mostly branched, longer than the leaves, up to 20-flowered, often about 12-flowered; peduncle glabrous or very slightly pubescent, especially at the base, not prickly; pedicels slender, up to 2 cm. long, glabrous, with two small caducous bracteoles towards the apex; bracts small and early caducous. *Flower buds* broadly ellipsoid, obtuse, glabrous. *Calyx* broadly campanulate from a turbinate base, about 6 mm. long, with five rather short broadly triangular lobes slightly puberulous on the margins. *Vexillum* finely mottled with purple, about 2·5 cm. long, rather shortly clawed, with two large free acuminate appendages about 5 mm. long at the base. *Alae* 2·3 cm. long, about 6 mm. broad. *Carina* more or less broadly spoon-shaped, 2·5 cm. long, the claw slightly longer than the limb. *Staminal sheath* 2 cm. long, free part of the filaments about 5 mm. long. *Ovary* and style glabrous. *Fruits* up to 24 cm. long, slender, at first torulose, but sometimes becoming nearly straight when ripe, beaked for some time by the persistent style. *Seeds* dark brown, about 4·5 mm. long.

TROPICAL AFRICA: Senegambia: Without definite locality, *Perrottet* 231 (type); 1839, *Guillemin* (H.K.) *Hendelot* (H.K.). *Roger* in *Herb. Gay* (H.K.); Richard-tol, 26th January, 1823, *Dollinger* (H.K.). Northern Nigeria. Sokoto Province, shrub or slender tree overhanging rivers, December, 1910, *J. M. Dalziel* 324; Abinsi and vicinity, banks of streams, common, 15th December, 1912, *J. M. Dalziel* 613; Katagum District, banks or streams, *J. M. Dalziel* 7, Benne River, October, 1907, *C. A. Parsons* 154, Nupe, sand banks, small shrub with yellow flowers, 1858, *C. Barter*, 970.

Vernacular: "Alambo" (*Dalziel* 324, 613).

Sesbania punctata [*] D.C., has been much misunderstood in herbaria, and has been considered to be widely distributed over tropical Africa and other countries. This is not, however, the case, and it appears to be confined to the banks of streams, in the Savannah country from Senegambia to Northern Nigeria, probably as far as Lake Chard or may be further. Parsons (No. 154) says it is a very common river shrub, 10 ft. high or so, overhanging and sometimes forming dense impenetrable hedges.

The species may be at once recognized by its small *branched inflorescence, mottled standard-petal* with very long *free-appendages* and *smooth* (not aculeate) peduncles.

4. **Sebania aegyptiaca** Poir. Encyc., vii, 128; Pers. Syn., ii, 316; D.C. Prodr., ii, 264 (1825); Baker in Oliv. Fl. Trop. Afr., ii, 134 (1871); Prain in Journ. As. Soc., Bengal, lxvi, 367 (1897).

A tall shrub or small tree. *Branches* pilose or pubescent, rarely almost glabrous, usually ribbed. *Leaves* 3·5–13 cm. long, petiole 0·3–1 cm. long, pubescent or villous; rachis flattened or grooved above, pilose, rarely glabrous; leaflets 9–27-jugate; subsessile, 0·6–2·8 cm. long, 1·5–6 mm. broad, oblong, truncate, rounded, or sometimes retuse at the apex, apiculate, scarcely narrowed to the base, pubescent beneath, pubescent or glabrous above, not punctate with minute black dots, with the mid-rib distinct beneath; the terminal leaflets somewhat oblong-obovate. *Stipules* about 5 mm. long, ovate, acuminate, pubescent, usually deciduous, if persistent then coiled. *Inflorescence* an axillary raceme, 2–10 cm. long, 3–8-flowered, usually longer than, sometimes shorter than, the subtending leaf, the base of the peduncle densely or scantily pilose, otherwise usually glabrous. *Bracts* 3–4 mm. long, ovate, acuminate, acute, pilose, deciduous; bracteoles 1·5 mm. long, linear, pubescent without, deciduous. *Pedicels* 0·5–1·5 cm. long, glabrous. *Calyx-tube* 3–5 mm. long, 5–7 mm. in diameter, glabrous, truncate, with five small teeth or lobes 1 mm. long, ovate, usually minutely ciliate. *Vexillum* 1·1–1·9 cm. long, 1·2–1·9 cm. broad, obovate, suborbicular, or transversely oblong, rounded and usually retuse at the apex, with a short claw 2–3 mm. long and with two free appendages above the claw; alae 1·3–1·8 cm. long, 3–6 mm. broad, oblong, rounded or retuse at the apex, with a curved linear claw 5–6 mm. long, and with a projecting tooth from the base of the lamina forming a horse-shoe-shaped loop with the claw: carima 1·4–1·5 cm. long, 5–6 mm. broad, almost plano-convex in outline, with a linear claw 6–8 mm. long, and a projecting tooth from the lamina forming a horse-shoe-shaped, or distinct, loop with the claw. *Staminal-sheath* 0·8–1·1 cm. long, 2–3·5 mm. broad at the base, with evident or distinct veins; free portion of filaments arcuate; anthers 0·75 mm. long, oblong; free stamen bent near the base. *Ovary* 1–1·3 cm. long, sub-compressed, glabrous, with two longitudinal bands; style 3–5 mm. long, arcuate; stigma small, capitate. *Fruit* twisted, 6–14 cm. long, 3–4 mm. thick, subterete, long-acuminate, acute, glabrous, divided into compartments within. *Seeds* oblong, truncate at both ends, reddish-brown, 4 mm. long, 2 mm. broad, glabrous.

TROPICAL AFRICA: Senegambia: *Perrottet*, Sierra Leone, *Vogel* 24. Northern Nigeria: Kontagora, shrub or tree by streams, *J. M. Dalziel* 38; 50 miles from Maifoni, Bornu, *A. C. Parsons*. Lake Chad and Bornu, *Talbot* 1242. Attah, branched shrub, *Vogel* 45. Congo: *Burton*; Stanley Pool, *Hens* 348. Angola Kiteve, Kunene River, *Baum* 955. Eastern Sudan: Kordofau, *Pfund* 404; *Kotschy* 72, 223, 347, 539, White Nile, *Brownell*; *Lynes*; *Schweinfurth* 998; *Muriel* 107; Kassala, *Schweinfurth*, tree near wells, Mut Oasis; Daklila, *MacDougal and Sykes* 187 (Herb. Mus. Brit.). Khartoum, *Schweinfurth* 865. Sedan, *Schweinfurth* 537. Blue Nile, *Muriel*, 69; *Schweinfurth* 962; near Matamma, *Schweinfurth* 1865. Colonia Eritrea: Adi Gana, *Pappi* 192; Abyssinia: *Cockburn*; *Quartin-Dillon and Petit* 167; *Wellby*; *Schweinfurth and Riva*, 681. British East Africa: various localities; *James*; *Elliot* 313; *Whyte-Grenfell*; *Dümmer* 1781, 2008; *Dowson* 336;

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[*] De Candolle's description reads as follows:—

S. punctata, herbacea glabra, foliolis oblongo-linearibus obtusissimis mucronatis, 10–30-jugis, petiolo laevi superne pubescente, racemis multifloris, corolla calyce sextriplo longiore, leguminibus compressis subtorulosis rachi duplo triplove longioribus—in Senegal. (Perrottet), Flores flavi lin. 8–9 longi, vexillo punctis purpureis extus maculato (v.s. comm. a cl. Perrottet).

Kassner 623, 628, Uganda; *Speke and Grant* 710; *Whyte*; *Scheffler* 227; *Scott Elliot* 7547, 6560, *Dümmer* 225; *Bagshawe* 491, 99, Tanganyika Territory: *Hildebrandt* 961; *Holst* 3442; *Riddelsdell* 150; *Goetze* 53; Rhodesia: Livingstone, *Rogers*, 7227; Victoria Falls, *Allen* 7; *Flanagan* 3084, 3113; *Galpin* 7046; *Kolbe* 3132; *Lamb* 2293; *Rogers* 5099, 5095, 7407, 13127, 13190, 13289, 13465; Matoppo Hills, *Rogers* 5159. Portuguese East Africa: *Kirk*; Rikatla, *Junod*, 229; Delagoa Bay, *Scott*, Lourenço Marques, *Schlechter* 11585; *Bolus* 7728. Maputa River, *Maputaland Exped. in Herb. Transvaal Mus.* 14402. Gazaland: Lower Buzi, *Swynnerton* 1393.

South Africa: Transvaal: Messina, *Rogers* 19404, Komatipoort, *Rogers* 423, 440, *and in Herb. Transvaal Mus.* 2604, Crocodile Poort; *Galpin* 1074; *Bolus* 7727, Barberton; *Pole Evans* 2944; Sheba Siding, *Thorncroft in Herb. Transvaal Mus.* 18235. Barberton, *Rogers* 20314. Swaziland, *Miss Stewart in Herb. Transvaal Mus.* 8975. Natal: Umlalasi, *Wylie in Herb. Wood* 8551; near Stanger, *Wood* 3859; near Durban, *Gueinzius*; *Gerrard* 1070; Umgeni, *Wood* 9562.

Var. **bicolor,** *Wight and Arn.* Prodr. 214 (1834); Prain in Journ. As. Soc., Bengal, lxvi, 367 (1897). *Sesbania atropurpurea*, Taub. in Engl. Bot. Jahrb., XXIII, 188 (1896); like the typical form in vegetative characters, but the standard petal entirely suffused with purple.

Tropical Africa: Senegal: *Perrottet* 232. Egyptian Sudan: Khartoum, in the garden of the Catholic Monastery and cultivated in the gardens below the town on the Blue Nile, 20–30 ft. high, *Schweinfurth* 796, 779. Cordofan, *Kotschy* 35.

South Africa: Natal: near Durban, *Wood* 8890.

A common species in most tropical countries. The tropical form of *Sesbania aegyptiaca* is said to have uniformly yellow flowers; a second form described by Persoon as *S. picta* has the standard finely mottled with purple. Whilst we have not considered it worth while to distinguish these two conditions, owing to the difficulty of determining them from dried specimens, we have maintained the var. *bicolor* of Wight and Arnot, which is probably only found in cultivation, and has the standard petal entirely suffused with purple. In Africa, as in parts of India, the mottled form appears by far the most common.

According to Prain (*l.c.*), *S. aegyptiaca* is a very familiar hedge plant in Indian fields and gardens. Its wood is still (in India) highly reputed as a source of charcoal for gunpowder manufacture.

5. **Sesbania Dummeri*** n. sp.

A slender shrub up to 5 cm. high, branchlets glabrous except when quite young; nearly terete. *Leaves* shorter or nearly as long as the inflorescence, 8–11 cm. long; rachis glabrous or slightly pubescent, not prickly; leaflets 14–16 pairs, stalked, oblong-linear, slightly narrowed and sub-equal-sided at the base, rounded and distinctly mucronate at the apex, 1·5–2 cm. long, about 4 mm. broad, glabrous or with a few minute hairs on the margin; stipules sub-persistent, linear or linear-lanceolate, acutely acuminate,

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* **Sesbania Dummeri** *Phillips et Hutchinson*, sp. nov.

Affinis *S. punctatae* DC. et *S. aegyptiacae* Poir., sed ab. ambilus pedunculis basin versus aculeatis inflorescentiis simplicibus differt.

Frutex gracilis usque ad 5 m. altus; ramuli maturi glabri, fere teretes. *Folia* inflorescentia breviora vel fere aequilonga; rachis glaber vel leviter pubescens, haud aculeatus; foliola 14–16-juga, petiolulata oblongo-linearia, basi leviter attenuata et subaequilata, apice rotundata et mucronata, 1·5–2 cm. longa, circiter 4 mm. lata, marginibus glabris vel minute pubescentibus; stipulae subpersistentes, lineares vel lineari-lanceolatae, acutae acuminatae, 7–10 mm. longae, sicco-brunneae, parce ciliolatae; stipellae minutae. *Inflorescentia* racemosa, folia aequilonga vel longior, usque ad 8-flora; pedunculi basin versus aculeati, pedicellis gracilibus, usque ad 1 c. longis, apicem versus bracteolis parvis caducis munitis; bracteae mox caducae. *Alabastra* oblique ellipsoidea, apice obtuse contracta. *Calyx* e basi turbinato late et leviter oblique, campanulatus, circiter 7 mm. longus, lobis 5 late triangularibus mucronulatis marginibus intra puberulo-ciliatis. *Vexillum* flavum, brunneo maculatum, circiter 2·5 cm. longum, breviter unguiculatum, ungue appendicibus oblique lanceolatis liberis circiter 7 mm. longis munito. *Alae* 2·5 cm. longae, circiter 7 mm. latae. *Carina* 2 cm. longa, limbo rhomboideo. *Tubus staminalis* 2 cm. longus, filamentorum partibus liberis 6 mm. longis. *Ovarium* et stylus glaber. *Fructus* juinior leviter torulosus, maturus non visus.

7–10 mm. long, brown when dry, sparingly ciliolate; stipels minute. *Inflorescence* racemose, as long or longer than the leaves, up to about eight-flowered; peduncle finely prickly, especially towards the base; pedicels slender, up to 1 cm. long, with two small caducous bracteoles towards the apex; bracts very early caducous. *Flower-buds* obliquely ellipsoid, obtusely contracted at the apex. *Calyx* broadly and slightly obliquely campanulate from a turbinate base, about 7 mm. long, with five broadly triangular mucronulate lobes puberulous-ciliolate within the margin. *Vexillum* yellow, finely mottled with brown, about 2·5 cm. long, rather shortly and broadly clawed, with two large obliquely lanceolate free appendages about 7 mm. long. *Alae* 2·5 cm. long, about 7 mm. broad. *Carina* 2 cm. long, the claw about as long as the more or less rhomboid limb. *Staminal sheath* 2 cm. long, free parts of the filaments 6 mm. long. *Ovary* and style glabrous. *Young fruits* slightly torulose; mature ones not seen.

TROPICAL AFRICA: Uganda: Kirerema, 4000 ft., margins of swamps, flowers yellow, spotted with brown, September, 1913, *R. Dümmer* 225. Without definite locality, *A. Whyte.*

6. **Sesbania grandiflora** Poir. Encycl., vii, 127 (1806); Pers. Syn., ii, 316 (1807).

A small tree or shrub; branchlets rather thick, very shortly and softly pubescent when young. *Leaves* much longer than the inflorescence, up to about 20 cm. long; rachis subterete, slightly pubescent or glabrous; leaflets about 15–20 pairs, stalked, rather elongate-oblong, rounded and slightly unequal-sided at the base, rounded and minutely mucronate at the apex, about 2·5–3 cm. long and 0·5–1 cm. broad, thinly chartaceous, shortly pubescent or glabrous, often glaucous, with about six pairs of lateral nerves; stipules deciduous; stipels subulate, minute. *Inflorescence* few-flowered, axillary; peduncle softly pubescent. *Flowers* large and showy, usually about 10 cm. long, pink or red. *Fruits* about 30 cm. long, flat.

This well-marked species, the native country of which is doubtful, is widely cultivated in the tropics for its handsome flowers. The leaves are often used as a substitute for spinach. We have seen African specimens from Senegambia (Herb. Gay), Gold Coast (Axim, *T. F. Chipp*, 391), and Lagos (*Dr. J. W. Rowland*).

7. **Sesbania caerulescens** *Harms* in Warb. Kunene-Sambesi Exped., 260 (1903). *S. Hockii*, De Wild, in Fedde Rep., XI, 544 (1913).

An erect plant about 3–5 m. high (*Eyles*); stems ribbed, glabrous, marked with brown lines. *Leaves* 5–13 cm. long; petiole 0·8–1·1 cm. long, glabrous; rachis channelled above, glabrous; leaflets 10–18-jugate, subsessile, 0·3–1·8 cm. long, 1·5–5 mm. long, oblong, obtuse, with an acute apiculus 0·5 mm. long, slightly narrowed at the base, punctate above with minute black dots, glabrous. *Stipules* 7 mm. long, oblanceolate, with a long point striped with brown, glabrous, deciduous. *Inflorescence* an axillary raceme, 4–6·5 cm. long, 1–4-flowered, as long as or shorter than the subtending leaf; bracts 7 mm. long, lanceolate, long-acuminate, striped with reddish-brown, glabrous, deciduous; bracteoles 3 mm. long, linear, otherwise similar to the bracts; pedicels 0·8–2·3 cm. long, glabrous. *Calyx-tube* spotted, 6–7 mm. long, 6·5–7 mm. broad, campanulate, glabrous; teeth 3 mm. long, ovate, acuminate, acute, ciliated. *Vexillum* a "washed-blue" (*Eyles*), spotted, 2·5–2·9 cm. long, 2·4–2·85 cm. broad, rounded, retuse at the apex, with a claw 3 mm. long. *Alae* spotted, 2·5–2·6 cm. long, 0·9–1 cm. broad, obtuse, with a linear claw 5 mm. long, 2 mm. broad, and with a downward projecting tooth. *Carina* spotted, 2–2·5 cm. long, 0·75–1·1 cm. broad, obtuse, with a linear claw 1–1·2 cm. long and a tooth from the lamina slightly projecting upwards. *Staminal sheath* 1·7–2 cm. long, 3–4 mm. broad at the base, with the free portion of the filaments arcuate; free stamen curved at the base. *Ovary* spotted, 1·7–2 cm. long, subcompressed; style 7–8 mm. long, arcute, glabrous; stigma small, ellipsoid. *Fruit* 23–25 cm. long, 3·5–4 mm. broad, linear, long acuminate, with a broad suture on one side, somewhat keeled on the other, glabrous. *Seeds* dark reddish-brown, 5 mm. long, 2·5 mm. broad, oblong, slightly narrowed at each end, glabrous.

Tropical Africa : Angola : Miane River at Kavamba, 1175, m., swampy ground, March, 1900, *Baum* 782 (type). River Kumpulua-Kuito, *Gossweiler* 3195. Luco plantations, an annual, erect, glaucous green herb up to 15 ft. high, fls. pale blue, in inundated marshes, February, 1906, *Gossweiler* 3745 (Herb. Mus. Brit.). Congo State : between Chiniama and Elisabethville, *Hock.* Rhodesia : Salisbury, April, *Flanagan*, 3121 ; Cleveland Dam. In colonies on most land 5000 ft., 10 ft. high, February, *Eyles*, 600.

8. **Sesbania cinerascens** *Welw. ex Baker*, in Oliv. Fl. Trop. Afr., ii, 134 (1871) ; Hiern in Cat. Afr. Pl. Welw., i, 231, under *Sesban* (1896).

A tall arborescent herb or shrub up to 5 m. high, ashy grey in colour. *Branches* glabrous, smooth. *Leaves* 10–24 cm. long, 14–30-jugate ; petiole 1–2 ·5 cm. long, glabrous ; leaflets 14–30 pairs, subsessile, oblong or oblong-linear, rounded above, minutely punctate, usually unequal at the base, 0 ·7–2 ·8 cm. long, 3–8 mm. broad, glabrous, with the mid-rib distinct beneath. *Stipules* foliaceous, 1–2 cm. long, ovate, acuminate, soon deciduous. *Inflorescence* axillary, racemose, 11–24 cm. long, rarely only 7 cm. long, longer or shorter than the subtending leaf ; peduncle glabrous ; pedicels 1–2 cm. long, glabrous ; bracts 1 ·5–5 mm. long, setaceous, caducous. *Flowers* yellow. *Calyx-tube* 5–6 mm. long, campanulate, with five distinct veins, glabrous ; lobes 1 ·5–2 mm. long, ovate, acute, woolly-ciliate. *Vexillum* spotted, 1 ·8–2 ·1 cm. long, 1 ·7–2 ·2 cm. broad, obovate, retuse at the apex, narrowed into a short claw, with two ridges above the claw ; alae 1 ·8–2 cm. long, 6–7 mm. broad, oblong or oblong-obovate, rounded above, produced into a curved claw 5–6 mm. long, with a downward projecting tooth above the claw ; carina 1 ·7 cm. long, obtuse, produced into a linear claw 1 cm. long, and with a downward projecting tooth above the claw. *Staminal sheath* 1–1 ·2 cm. long, 3 ·5–6 mm. broad at the base ; free portion of filaments arcuate ; anthers 0 ·5 mm. long, oblong. *Ovary* 0 ·9–1 ·4 cm. long, linear, with two longitudinal bands ; style 5 mm. long, at right angles to the ovary ; stigma small, capitate. *Fruit* 26 cm. long, semi-terete, acuminate. *Seed* 9 mm. long, 3 mm. in diameter, oblong, rounded at each end, glabrous.

Tropical Africa : Angola : Pungo Andongo, in thickets near the River Lombe, fl. and fr. Mar. *Welwitsch*, 1999 ; in bushy places by streams, near Pedra Cabondo, fl. and fr. Apr., *Welwitsch*, 2000. Rhodesia : Matoppos, c. 4000 ft., May, *Rogers* 7924 ; Mazoe near Salisbury, April, *Flanagan* 3122, Victoria, *C. F. H. Monro*, 1932 ; near Bulawayo, *Rand* 448 ; *Eyles* 1235, 1514.

South Africa : Natal : Itafamasi, *Wood*, 882, Insuzi, April, *Wood*, 5311, and in *Natal Govt. Herb.* 8677 ; Natal, *Gerrard* 32. Transvaal : Barberton Div., banks of Kaap River, 2000, September, *Galpin* 1074 B ; Barberton, *Rogers* 21567, 23891 ; Pietersburg Div., Macoutsie River, *Breijer in Herb. Transvaal Mus.* 18664.

Mr. Eyles says in regard to his specimen No. 1235 : " In December, 1917, I planted here several of the seeds of No. 1235 (over fourteen years old) after soaking forty-three hours in water. Germination was 100 per cent., and one of the plants has been growing since. It is about 12–15 ft. high, and in March it was profusely covered with medium-sized yellow flowers which never opened until 4.30 p.m. daily."

9. **Sesbania macrantha** * *Welw.*, MSS. *S. punctata* Hiern. in Cat. Afr. Pl., Welw., i, 231, partly, non D.C.

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* **Sesbania macrantha** Welw. mss., sp. nov. affinis *S. cinerascenti* Welw. sed. caulibus et pedunculis dense aculeatis differt.

Herba usque ad 5 m. alta ; rami leviter costati, plerumque aculeati. *Folia* 5 ·5–18 cm. longa ; petioli 0 ·7–2 cm. longi, glabri vel parce aculeati ; foliola 5–34-jugata, petiolulata, 0 ·9–2 ·4 cm. longa, 2–6 mm. lata, oblonga vel oblongo-linearia, apice rotundata et mucronata, basi inaequalia, glabra, punctis minutis nigris ; stipulae usque ad. 1 ·4 mm. longae, lanceolatae, acuminatae foliaceae, subpersistentes. *Inflorescentia* 13–20 cm. longa, 6–14-flora ; pedunculi inferne aculeati ; bracteae mox deciduae ; pedicelli 0 ·6–1 ·5 cm. longi, glabri. *Calycis tubus* 5–6 mm. longus, campanulatus glaber, dentibus 1 mm. longis, ovatis, subacuminatis, lanato-ciliatis. *Vexillum* 1 ·7 cm. longum, 2 cm. latum, rotundatum, retusum. *Alae* 1 ·8 cm. longae, 8 mm. latae, obovatae, obtusae. *Carnia* 1·5 cm. longa, 5 ·5 mm. lata. *Vagina* staminalis 1 ·2 cm. longa. *Ovarium* compressum. *Fructus* 25–29 cm. longus, leviter compressus, circiter 6 mm. latus, acuminatus marginibus incrassatis. *Semina* 6 mm. longa, 3 mm. lata, oblonga, utrinque rotundata, glabra.

Herb. up to 5 m. high. *Branches* slightly ribbed, usually covered with prickles, glabrous. *Leaves* 5·5–18 cm. long; petiole 0·7–2 cm. long, glabrous, sometimes with a few prickles; leaflets 5–24-jugate, petiolulate, 0·9–2·4 cm. long, 2–6 mm. broad, oblong to oblong-linear, rounded and mucronate at the apex, unequal at the base, glabrous, punctate with minute black dots; petiolule 1 mm. long; stipules up to 1·4 mm. long, lanceolate, acuminate, foliaceous, subpersistent. *Inflorescence* 13–20 cm. long, 6–14-flowered; lower portion of peduncle covered with prickles; bracts deciduous, not seen; pedicels 0·6–1·5 cm. long, glabrous. *Calyx-tube* 5–6 mm. long, campanulate, five-veined, glabrous; teeth 1 mm. long, ovate, subacuminate, woolly-ciliate. *Vexillum* 1·7 cm. long, 2 cm. broad, rounded, retuse above, produced into a claw 2 mm. long; alae 1·8 cm. long, 8 mm. broad, somewhat obovate, obtuse, produced into a curved linear claw 5 mm. long, and with an inclined tooth forming a horse-shoe-shaped loop with the claw; carina 1·5 cm. long, 5·5 mm. broad, obtuse, with a downward projecting claw. *Staminal sheath* 1·2 cm. long, 6 mm. broad at the base; the free portion of the filaments arcuate; free stamen kneed near the base. *Ovary* compressed, with two longitudinal bands; style arcuate; stigma capitate. *Fruit* 25–29 cm. long, somewhat compressed, about 6 mm. broad, acuminate; the valves thickened. *Seeds* 6 mm. long, 3 mm. broad, oblong, rounded at each end, glabrous.

TROPICAL AFRICA: Uganda: Kampala, tall handsome shrub, *Scott Elliot* 7267; "Elephant grass" land near Kasala Forest, slender, up to 15 ft. high, fls. yellow, *Dümmer* 742. British East Africa: Aberdare Mts., 5000–6500 ft., *Battiscombe* 8; two days' march from Mumias, *A. Whyte*; Nyasaland: Nyika Plateau, 6000–7000 ft., *A. Whyte*; Congo: Elizabethville, *Rogers* 26224; Southern Rhodesia: Odzani River Valley, Manica Dist., *A. J. Teague* 15; Angola: Huilla, in bushy places along the banks of the River Monino, fls. and fr., *Welwitsch* 1995; Pungo Andongo, in palm groves on the banks of the River Cuanza, near Sansamanda, rather rare, *Welwitsch* 1997.

SOUTH AFRICA: Transvaal: Waterval Onder, *Jenkins in Herb. Transvaal Mus.* 6724.

This appears to be a very fine species, resembling in its aculeate stems and peduncles *S. aculeata*, but with much larger stipules, inflorescence, and fruits than in that species.

10. **Sesbania pubescens,** D C. Prodr. ii, 265 (1825); Baker in Oliv. Fl. Trop. Afr. ii, 135 (1871); Hiern. in Cat. Afr. Pl. Welw. i, 231 (under *Sesban*) (1896). *Emerus pubescens*, Schum. Guin. Pl., 354 (1827).

A slender shrub growing near water; branches ascending, slightly angular when older, finely and rather laxly pubescent; young growths densely silky-pubescent. *Leaves* three or four times as long as the inflorescence, about 12 cm. long; rachis thinly pubescent; leaflets 12–18 pairs (usually about 17 pairs), shortly stalked, elongated-oblong, rounded on one side, slightly narrowed on the other, rounded and with a prominent subulate mucro at the apex, 1·5–2·3 cm. long, 5–6 mm. broad, glabrous but densely covered with minute black spots above, adpressed silky-pubescent below; stipules soon falling off, linear-subulate, very acute, 6–7 mm. long, with narrowly membranous edges, slightly pubescent up the middle; stipels minute. *Inflorescence* about 3 cm. long, or up to 8 cm. very slender, simply racemose or rarely branched; peduncle thinly pubescent; pedicles about 5 mm. long; bracts like the stipules, but with wider membranous margins, soon falling. *Flowers* yellow, about 1 cm. long; buds ellipsoid, beaked at the apex, about 5 mm. long, glabrous. *Calyx* campanulate from a broadly turbinate base, 5 mm. long, with five broadly triangular acute lobes slightly puberulous on the margin. *Vexillum* probably not spotted, about 8 mm. long, with two wholly adnate appendages on the claw. *Alae* about 8 mm. long. *Carina* limb as long as the claw. *Ovary* and style glabrous. *Fruits* curved, about 15 cm. long, 3 mm. broad, with thickened margins, acutely beaked, glabrous. *Seeds* oblong, reddish-brown, about 3 mm. long.

TROPICAL AFRICA: Senegambia: Marshes near Nboro, 1840, *Brunner;* without locality, *Thiery; Perrottet* 228. Gold Coast: Accra, *T. W. Brown* 419; Axim, *T. F. Chipp* 426; Aburi Gardens, *W. H. Johnson* 950. Dahomey: Cotanou, *Debeaux* 150

(Herb. Mus. Brit.). Western Sudan: between Madoo and Berirem, *A. Chevalier* 10095. St. Thomas Island, *A. Moller* 86. Angola: Loanda; rather rare in moist sandy places (near Praia de Zamba Grande, fl. and fr. Mar., Apr., *Welwitsch* 1992. Tanganyika Territory, *Stuhlmann* 7906.

This species is distinguished especially by its very small flowers and slender inflorescences. *S. sericea* D.C. from Ceylon is a very closely allied species, with fruits usually broader than those of *S. pubescens.*

11. **Sesbania Dalzielii** * n. sp.

A slender shrub up to 2 m. high; branches weak, angular when young, slightly pubescent, at length striate. *Leaves* usually longer than the inflorescence, 15–25 cm. long; rhachis and leaflets silky pubescent; leaflets up to 40 pairs, shortly stalked, linear-oblong, rounded and acutely mucronate at the apex, obliquely acute at the base, 0·8–2·5 cm. long, 2–3·5 mm. broad, coriaceous, appressed silky-pubescent on both surfaces; stipules linear-subulate, acute, very soon falling off; stipels very minute. *Inflorescence* slender and laxly flowered; the uppermost ones longer than their subtending leaves; peduncle pubescent towards the base; pedicels slender, glabrous, bibracteolate towards the apex; bracteoles linear, 2 mm. long, falling off before the flower opens. *Flower-buds* ellipsoid-turbinate, shortly acuminate, glabrous. *Calyx* campanulate, acutely turbinate at the base, 5 mm. long, glabrous outside, ciliate within the five acutely acuminate lobes. *Vexillum* with two small sessile appendages on the claw. *Ovary* glabrous. *Fruit* about 20 cm. long, strongly torulose, shortly and acutely beaked, about 25-seeded. *Seeds* oblong-ellipsoid, 5 mm. long, green and shining.

TROPICAL AFRICA: Northern Nigeria: Abinsi and vicinity in marshy places, *J. M. Dalziel* 614 (type). Katagum District, marshy places, *J. M. Dalziel* 8, "Niger," *Bakie* 9. Jeba, on the Niger, *Barter.* Western Sudan: Koulikoro, *Chevalier* 3390.

12. **Sesbania Wildemannii,** nom. nov.

Sesbania affinis De Wild, in Ann. Mus. Cong. Ser. V, 1, 141 (1904), non Schrad.

Stems terete, finely longitudinally grooved, glabrous. *Leaves* up to about 9 cm. long; rhachis angular, shortly pubescent; leaflets about 20–25 pairs, linear-oblong, rounded and mucronate at the apex, obliquely unequal-sided at the base, about 8 mm. long and 2 mm. broad, grey, at length glabrous above, finely appressed-pubescent below; stipules small, deciduous. *Inflorescence* few-flowered, very slender; peduncle slightly pubescent; pedicels nodding, 7 mm. long; bracts and bracteoles deciduous. *Flowers* about 1·5 cm. long. *Calyx* ribbed, pubescent outside, with five acutely triangular teeth. *Vexillum* finely mottled outside, with two sessile appendages on the claw. *Fruits* very narrow, about 15 cm. long and 2·5 mm. broad, glabrous, straight or very slightly torulose. *Seeds* oblong, rounded at the ends, 3 mm. long, brownish.

TROPICAL AFRICA: Belgian Congo: Between Leopoldville and Mombazi, *Gillet.* 2626.

We have seen rather an imperfect specimen of this species, which appears distinct on account of its hairy calyx tube.

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* **Sesbania Dalzielii,** *Phillips et Hutchinson*, sp. nov., affinis *S. pubescenti* DC., sed fructibus torulosis differt.

Frutex gracilis usque ad 2 m. altus; rami debiles, primum angulares, leviter pubescentes, demum striati. *Folia* inflorescentia plerumque longiora, 15–25 cm. longa; rachis et foliola sericeo-pubescentia; foliola usque ad 40-jugata, breviter petiolulata, lineari-oblonga, apice rotundata et acute mucronata, basi oblique acuta, 0·8–2·5 cm. longa, 2–3·5 mm. lata, coriacea, utrinque apresse sericeo-pubescentia; stipulae lineari-subulatae, acutae, mox deciduae; stipellae minutissimae. *Inflorescentia* gracilis et laxiflora; pedunculi basin versus pubescentes; pedicelli graciles, glabri, bibracteati; bracteolae lineares, 2 mm. longae, mox deciduae. *Alabastra* ellipsoideo-turbinata, breviter acuminata, glabra. *Calyx* campanulatus, basi acute turbinatus, 5 mm. longus, extra glaber, lobis 5 acute acuminatis intra ciliatis. *Vexillum* basin versus appendicibus sessilibus instructum. *Ovarium* glabrum. *Fructus* circiter 20 cm. longus, valde torulosus, breviter et acute rostratus. *Semina* circiter 25, oblongo-ellipsoidea, 5 mm. longa, viridia et nitida.

13. **Sesbania leptocarpa,** D.C. Prodr. ii, 265 (1825); Guill. et Perrott. Fl. Seneg. i, 199, (1830–33); Baker in Oliv. Fl. Trop. Afr., ii, 135, partly (1871).

Stem herbaceous, sparingly branched, glabrous, finely grooved. *Leaves* up to 9 cm. long, longer than the inflorescence; rachis very slightly aculeate towards the base; leaflets 8–18 pairs, distinctly stalked, narrowly oblong, very unequal-sided at the base, rounded and finely mucronate at the apex, 1–1·3 cm. long, about 2·5–3 mm. broad, finely punctate with numerous black spots on both surfaces, otherwise glabrous; stipules very soon falling off, linear-lanceolate, acute, about 2·5 mm. long, slightly hairy towards the tips; stipels minute, like little points. *Inflorescence* a simple raceme, about three-flowered; peduncle slender, slightly aculeate towards the base; bracts like the stipules, very soon falling off; bracteoles small, at the base of the calyx tube. *Flowers* small, about 1 cm. long. *Calyx* turbinate-campanulate, 4 mm. long, glabrous, with five triangular subacute teeth slightly puberulous on the margin. *Vexillum* suborbicular, striate and slightly punctate, about 1 cm. long; claw without appendages at the base or only slight thickenings representing them. *Alae* and keel striate. *Ovary* and style glabrous. *Fruits* 12–15 cm. long, 3 mm. broad, torulose, with a dark blotch between the joints, acutely acuminate, 14–24 seeded. *Seeds* black, 3 mm. long.

TROPICAL AFRICA: Senegambia: Moist plains around St. Louis, at north Point, near the Walo River, Richard-Tol, Dagana, etc., *Hendelot* 489; *Perrottet* 233.

This species is distinguished by its slightly aculeate peduncles, by the *absence of appendages* from the claw of the vexillum, and the torulose blotched fruits. It is apparently confined to Senegambia.

14. **Sesbania pachycarpa** D.C. Prodr. ii, 265 (1825); Guill. et Perrott. Fl. Seneg. 200, t. 50 (1830–33); Baker in Oliv. Fl. Trop. Afr., ii, 134, partly (1871). *Sesban phaerocarpus*, Hiern. in Cat. Afr. Pl. Welw. i, 232, partly, non Welw.

Stems herbaceous, pithy, glabrous. *Leaves* 40 cm. long, many times longer than the inflorescence; rachis contracted at the base, glabrous; leaflets very numerous, linear-oblong, truncate or rounded and mucronate at the apex, slightly oblique at the base, 1–2 cm. long, 3–5 mm. broad, glaucous-green, glabrous, very minutely punctate with black spots; stipules linear, nearly 1 cm. long, glabrous. *Inflorescence* short, slender, few-flowered, or sometimes reduced to two or three flowers; peduncle smooth; pedicels up to 1 cm. long, with two early deciduous bracteoles towards the apex. *Calyx* broadly campanulate, from a sharply turbinate base, 5 mm. long, finely puberulous within the margins of the acutely triangular lobes. *Petals* yellow; the vexillum densely mottled with dark spots. *Appendages* to vexillum adnate to the claw. *Fruits* erect, curved, about 15 cm. long and 7 mm. broad, when ripe acutely beaked, with straight margins to the valves, but with slight constrictions between the seeds between the margins. *Seeds* separated by partitions of the sub-membranous endocarp, broadly oblong, truncate at each end, 3·5 mm. long, rarely 3 mm. thick, pale brown.

TROPICAL AFRICA: Senegambia: *Perrottet* 230 (Herb. Mus. Brit.). Northern Nigeria: Bornu, *E. Vogel* 79; Katagum District, *J. M. Dalziel* 9; near Abinsi, *J. M. Dalziel* 615. Eastern Sudan: South Kordofan, *Pfund* 134; *Kotschy* 72. "Upper Nile," *Freeman and Lucas*. Abyssinia: Terrefera Valley, *Schimper* 775. Angola: Loanda, *Welwitsch* 1991 (Herb. Kew. non Herb. Mus. Brit.); Mossamedes, *Welwitsch* 1996*b*.

Known in Nigeria as "Zamarke" (*Dalziel*).

15. **Sesbania aculeata** *Pers.* Synops. ii, 316, partly (1807); D.C. Prodr., ii, 265 (1825); Prain in Journ. Asiat. Soc., Bengal, lxvi, 369 (1897). *Sesban punctatus*, Hiern. in Welw. Cat. Afr. Pl. i, 230, partly. *Sesban aegyptiacus* Hiern, *l.c.*, 231, non Poir.

A weed of moist places often up to 5 m. high; stem patently branched from the base to apex, often aculeate, but sometimes smooth. *Leaves* up to 25 cm. long; rachis generally aculeate below; leaflets about thirty pairs, generally about 1·5 cm. long and

3 mm. broad, glabrous and often glaucous; stipules linear-lanceolate, very acute, about 7 mm. long, glabrous, often sub-persistent. *Inflorescence* mostly rather few-flowered and much shorter than the subtending leaf; peduncle aculeate or smooth; pedicels slender, about 5 mm. long, glabrous. *Flowers* yellow, about 1·5 cm. long. *Calyx* tube 3 mm. long, campanulate, glabrous; teeth 1–2 mm. long, subacute. *Vexillum* yellow spotted on the back, with two sessile linear appendages on the claw. *Alae* oblong or oblong-obovate. *Carina* 1·3 cm. long, 4 mm. broad. *Staminal sheath* 1–1·2 cm. long. *Ovary* glabrous. *Fruits* 15–20 cm. long, straight or slightly curved, about 3 mm. thick, tipped with a long slender acute beak. *Seeds* oblong-ellipsoid, rounded at both ends, about 3 mm. long.

TROPICAL AFRICA: Senegal, *Perrottet* 229. Sierra Leone: Falaba, *Scott Elliott* 5220; near Luseniya, about 15 ft., with purplish flowers, *Scott Elliott* 4219. Gold Coast: Accra, *Krauss*; Lagos, *J. M. Dalziel* 1227; *Macgregor* 13. French Congo: Ft. Sibut, Krebedje, *Chevalier* 5675. Cameroons: Yaunde, *Zenker and Staudt* 501. Angola: Quiballa, *Monteiro*. Mossamedes, *Welwitsch* 1996. Between Huilla Mission Station and Chibia, *H. H. W. Pearson* 2699, 2724. Golungo Alto, *Welwitsch* 1994. Mossamedes. Eastern Sudan: *Schweinfurth* 1046, 1869; *Kotschy* 539; *Brown* 1075. Abyssinia: *Quartin-Dillon and Petit* 169. Colonia Eritraea: Beni-Amer, *Pappi* 161. British East Africa: Mombassa, in damp meadows, *Hildebrandt* 1990; *Kassner* 471; *Usambara, C. Holst* 3212. Nyasa Highlands, *Stolz* 267. Nyasaland: *Johnson* 361; *Buchanan* 910. Rhodesia: Matopos, *Allen* 731. Ngamiland: Kwebe Hills, swampy places, *Lugard* 161, 161*a*, 168. Portuguese East Africa: Lourenço Marques, *Schlechter* 11585; *Wilms* 422.

SOUTH AFRICA: Transvaal: Shilovane, *Junod* 1131. Crocodile Poort, shrub 8 ft., *Galpin* 1074*a*. Aapies River, north of Pretoria, *A. Haagner in Herb. Conrath* 1185. Barberton Division: Nelspruit, *Rogers* 23858. Natal, *Drege, Sutherland; Gerrard* 32; *Keun, Wood* 287, 1593; *Gerrard and McKen.* 734.

A common weed in most tropical countries.

16. **Sesbania arabica,** *Hochst. ex Steud.*, Nom. ed. II, ii, 572 (1840).

Stems glabrous, rather slender, finely grooved. *Leaves* up to 15 cm. long, much longer than the inflorescence; rachis smooth; leaflets up to thirty pairs, distinctly stalked, linear-oblong, rounded and minutely mucronate at the apex, obliquely one-sided at the base, about 1·5 cm. long and 2·5–3 mm. broad, glaucous-green; stipules lanceolate, with a long linear acuminate apex, slightly pubescent on the margin, sub-persistent; stipels very minute, like little points. *Inflorescence* mostly about two or three flowered, slender; peduncle glabrous or nearly so; bracteoles paired at the base of the calyx, narrowly lanceolate, with membranous margins. *Flowers* apparently yellow; the vexillum finely mottled with purple. *Calyx* broadly campanulate from a shortly turbinate base, about 5 mm. long, slightly pubescent within the margins of the acute triangular teeth. *Vexillum* with two linear sessile appendages on the claw. *Fruits* erect, nearly straight, up to about 25 cm. long, strongly constricted between the seeds, segments about 6 mm. long. *Seeds* oblong-ellipsoid, rounded at both ends, 4·5 mm. long, dark brown, slightly shining.

TROPICAL AFRICA: Northern Nigeria: Benne Valley, Muri Province, Nov., *P. H. Lamb* 69. Eastern Sudan: S. Kordofan, *Pfund* 132, 308; *Kotschy* 47. Blue Nile, near "Camp Ardeba," *Muriel* 65. Mestra Zeraf Wood Station, *Brown* 1737. Colonia Eritrea: Beni-Amer, *Pappi* 166.

Occurs also in Southern Arabia. Arabic name, "Tawri" (*Muriel*).

17. **Sesbania sphaerocarpa** *Welw.* Apont. 590, No. 82 (1858); Hiern. in Cat. Afr. Pl. Welw., i, 232, partly. *Sesbania sphaerosperma,* Welw. ex Baker in Oliv. Fl. Trop. Afr., ii, 135 (1871).

Herb, rather woody at the base, about 30 cm. high or more; stems smooth or sparingly aculeata. *Leaves* up to 15 cm. long; rachis slightly aculeate below; leaflets up to about twenty pairs, elongate-oblong, rounded and minutely mucronate at the apex, unequal-sided at the base, 1·5–2·5 cm. long, about 5 mm. broad, pale glaucous-green, glabrous; stipules linear-subulate, acutely acuminate, about 8 mm. long, slightly hairy on the margins, soon falling off. *Inflorescence* very small, 2–3-flowered, about 1·5 cm. long; peduncle slender, slightly hairy towards the base; pedicels very slender, about 5 mm. long, glabrous; bracts and bracteoles caducous. *Calyx* widely campanulate, acutely turbinate at the base, with five short acute lobes. *Vexillum* broadly orbicular, with two sessile linear appendages on the claw. *Fruits* about 16 cm. long, 3 mm. broad, linear, acutely acuminate, with an undulate wing on the back of the valves. *Seeds* nearly rounded, small.

TROPICAL AFRICA: Angola: Loanda District, *J. Gossweiler* 253, 1479; Loanda, *Welwitsch* 1991, 1993.

18. **Sesbania microphylla,** *Harms* in Kunene-Samb. Exped., 260 (1903).

An erect branching herb, up to 2 m. high; branches ribbed, glabrous. *Leaves* 2–12 cm. long; petiole 0·2–1 cm. long, glabrous; rachis flattened on the upper surface, glabrous, leaflets 5–30-jugate, subsessile, 2–7 mm. long, 0·5–2·5 mm. broad, oblong or elliptic, obtuse, shortly mucronate, slightly unequal at the base, punctate above with minute black dots, glabrous, with the mid-rib distinct beneath. *Stipules* 2·5–3 mm. long, setaceous, deciduous, or persistent. *Inflorescence* axillary, racemose, three or four flowered, 2–6 cm. long, longer or shorter than the subtending leaf; base of peduncle glabrous; bracts deciduous, not seen; bracteoles 2·5 mm. long, setaceous, persistent in mature flowers; pedicels 1–2 cm. long, glabrous. *Calyx-tube* 3 mm. long, 3 mm. in diameter, campanulate, with five broad brown bands; teeth 1 mm. long, ovate, with brown acuminate tips. *Vexillum* yellow, mottled with numerous fine purple spots on the back, 1·5 cm. long, 1·1 cm. broad, ovate-oblong, rounded above, with two adnate linear-appendages within a short claw 1·5 cm. long. *Alae* 1·6 cm. long, oblong, obtuse, with a linear claw 2·5 cm. long, and a downward projecting tooth from the base of the lamina. *Carina* 1·65 cm. long, 5 mm. broad, almost plano-convex in outline, with a linear claw 6 mm. long, and a downward projecting tooth from the lamina. *Staminal sheath* 1 cm. long, 2 mm. broad at the base, with the free portion of the filaments arcuate; free stamen slightly bent at the base; anthers 0·75 mm. long, ovate. *Ovary* 1·3 cm. long, sub-compressed, with two faint longitudinal bands; style 4 mm. long, arcuate; stigma capitate. *Fruit* 11·5–12·5 cm. long, 2–2·5 mm broad, linear, acutely acuminate, laterally compressed, moniliform *Seeds* dark brown, 3 mm. long, 1·5 mm. broad, oblong, rounded at both ends, glabrous.

TROPICAL AFRICA: Angola: Mouth of the Longa River, 3480 ft., 22nd December, 1899, *H. Baum* 569. Eastern Sudan: Bahr. el Ghazal, flowers yellow mottled with black, *A. F. Broun*. Rhodesia: Lomagundi, Darwendale on pierite formation, in vleis, April, *Eyles*, 695; Bulawayo, *J. S. MacDonald in Herb. Dept. Agric.* 4942.

19. **Sesbania mossambicensis,** *Klotzsch* in Peters, Reise Mossamb. Bot. 45 (1861). *Sesbania macowaniana* Schinz. in Verh. Bot. Ver. Brand, XXX, 165 (1888).

A weak sparingly branched herb about 1 m. high. *Branches* striate, glabrous. *Leaves* 1·5–11 cm. long; petiole 2–7 mm. long, glabrous; rachis flattened or channelled above, glabrous, rarely sparsely covered with hairs; leaflets 7–33-jugate, subsessile, oblong or oblong-linear, rounded at the apex, shortly apiculate, unequal at the base, glabrous, 0·3–1 cm. long, punctate with minute black dots on the upper surface, with the mid-rib distinct beneath; stipules usually persistent, 2–5 mm. long, ovate or ovate-lanceolate, acuminate, acute. *Inflorescence* an axillary raceme, 1–7 cm. long, 3–8-flowered, longer or shorter than the subtending leaf; peduncles glabrous; bracts generally persistent, 2 mm. long, linear; bracteoles persistent, 1·5 mm. long, linear; pedicels 3–7 mm. long, glabrous. *Calyx-tube* 3–4 mm. long, 2–3 mm. in diameter, campanulate, glabrous, with five dark-brown bands; teeth 1–1·5 mm. long, acuminate from a triangular base, acute, with black tips, usually with cottony hairs on the margins. *Vexillum* striped with dark veins, but not mottled, 0·8–1·1 cm. long, 0·8–1·1 cm. broad, subrotund, obovate or transversely oblong, rounded and retuse at the apex, with a claw 2 mm. long. *Alae* 0·8–1·2 cm. long, 3–4 mm. broad, obovate or obovate-oblong, obtuse, with a linear claw 1·5–3 mm. long, and a short downward projecting tooth from the lamina. *Carina* 0·9–1·2 cm. long, 3–4 mm. broad, almost plano-convex in outline, obtuse, with a linear claw 5–7 mm. long, and a downward projecting claw from the lamina. *Staminal sheath* 0·7–1 cm. long, 1–3 mm. broad at the base, with the free portions of the filaments arcuate; free stamen dilated at the base. *Ovary*. 0·7–1·1 cm. long, subcompressed, with two faint longitudinal bands; style 3–4 mm. long, arcuate, glabrous; stigma capitate. *Fruit* 4–6 cm. long, moniliform, long-acuminate. *Seeds* dark reddish-brown, 2·5 mm. long, 1·25 mm. broad, oblong, rounded at each end, glabrous.

TROPICAL AFRICA: Maniniam: On the Tubbo River, *G. Schweinfurth* 3674. Portuguese East Africa: Cabaceira Peninsula and near Quillimane, *Peters* (type). Congo: Elisabethville, *Rogers* 10872; without locality, *Rogers* 13641.

SOUTH AFRICA: Herbert Div., Biddulphis, nine miles north of Orange River at Hopetown, February, *Bolus* 1835; Gariep River, *Pappe*; Transvaal: Makapansberge, Streydpoort, *A. Rehmann* 5543. Pretoria Div., near the Aapies River, 4500 ft., January, *Schlechter* 4179; *Miss Leendertz* 3205; Pretoria, March, *Mrs. Pott in Herb. Transvaal Mus.* 11333; *Miss Leendertz* 4413; Hatherley, near Pretoria, *Rogers* 23943; Rustenburg Div., Rustenburg, January, *Playford in Govt. Herb.* 17268; Crocodile River, March, *Burtt-Davy*, 9297; Zeerust Div., Zeerust, *Rogers* 22672; Potchefstroom Div., Potchefstroom, *Miss Leendertz* 3205; Pietersburg Div., grassy plains near Pietersburg, 4000 ft., February, *Bolus* 10879. Bechuanaland: Masupa River, *E. Holub*. S.W. Protectorate: Klein Namutoni, *J. W. F. Breijer in Herb. Transvaal Mus.* 20618.

§ DAUBENTONIA.

20. **Sesbania tetraptera,** *Hochst. ex Baker* in Oliv. Fl. Trop. Afr., ii, 136 (1871).

Stems ridged, otherwise glabrous, about 4 mm. thick. *Leaves* up to 12 cm. long, nearly twice as long as the inflorescence; rachis sparingly pubescent when young, soon becoming quite glabrous or with a few small prickles on the lower side towards the base; leaflets about fifteen pairs, shortly stalked, narrowly oblong, unequal-sided at the base, truncate-rounded and sharply mucronate at the apex, 1·2–2 cm. long, 3–4·5 mm. broad, glabrous, spotted with minute black dots on the upper side, with no visible nerves or veins; stipules subpersistent, subulate-lanceolate, very acute, 5–6 mm. long, very slightly pubescent inside; stipels very minute and subulate. *Inflorescence* a simple raceme, few (up to seven) flowered; peduncle up to 6 cm. long, thickened at the base and there closely beset with subulate-triangular prickles; bracts linear-subulate, about 3 mm. long, persistent; pedicels about 7 mm. long, filiform, with a pair of linear deciduous bracteoles at the apex about one-third the length of the calyx. *Calyx* campanulate, turbinate at the base, 5 mm. long, with five short triangular lobes, the latter minutely pubescent inside the margin. *Vexillum* broadly orbicular, 1·2 cm. long, cuneate into a short claw about 2 mm. long, with two linear sessile ridge-like appendages about 2 mm. long near the base. *Alae* oblong; limb 8·5 mm. long; claw bent, 5 mm. long. *Carina* broadly semilunar; limb 8 mm. long, with an acutely triangular tooth on the upper side; claw curved, 5 mm. long. *Staminal sheath* 0·8 cm. long, free part of filaments 3–4 mm. long; anthers 0·75 mm. long. *Ovary* 8 mm. long, four-winged; style bent at right angles, 3 mm. long, puberulous towards the top. *Fruits* much longer than the leaves, 15 cm. long, 1 cm, broad, broadly four-winged, stipitate, for about 1 cm. at the base, acutely acuminate at the apex. *Seeds* reddish-brown, oblong-elliptic, broadly rounded at both ends, 6 mm. long, with a small circular hilum in the middle.

Tropical Africa : Nubia : In dry limestone of Arasch-Cool, 7th October, 1839, *Kotschy* 131 (H.K.). "Upper Egypt and Cordofan," without definite locality, 1837–38, *Kotschy* 83 (H.K.).

21. **Sesbania Kirkii** * n. sp.

Stems slightly ridged or nearly smooth, not prickly, rather stout, about 5–6 mm. thick. *Leaves* up to 30 cm. long, more than twice as long as the inflorescence ; rachis sparingly pilose when very young, soon glabrous or with one or two small prickles on the lower side towards the base ; leaflets up to about 35 pairs, shortly stalked, elongate-oblong or linear-oblong, slightly unequal-sided at the base, rounded and mucronate at the apex, 2 ·5–3 ·5 cm. long, about 5–6 mm. broad, spotted with minute black dots on the upper surface, otherwise glabrous, with several faint lateral nerves ; stipules persistent, lanceolate or linear-lanceolate, acutely acuminate, 1 cm. long, pubescent inside ; stipels distinct, subulate, about 1 mm. long. *Inflorescence* several flowered, racemose, slender, up to 14 cm. long ; peduncle slender, broadened towards the base and there provided with numerous subulate spreading prickles ; bracts persistent, longer than the pedicels, linear-lanceolate, very acute, 5–6 mm. long, sparingly ciliate ; pedicels about 4 mm. long, slender, glabrous, with a pair of persistent bracteoles a little more than half as long as the calyx. *Calyx* campanulate, turbinate at the base, 4 mm. long, with five triangular lobes about 1 mm. long, the latter minutely ciliolate. *Petals* as in *S. tetraptera* Hochst. *Fruits* much shorter than the leaves, about 15 cm. long and nearly 1 ·5 cm. broad, stipitate for about 1 cm. at the base, very acutely beaked, acuminate, broadly four-winged. Ripe *seeds* not seen.

Tropical Africa : Zambezi Basin : Tette, fls., February, 1859, *Dr. J. Kirk* (H.K.) ; near Sena, fr., June, 1859, *Dr. J. Kirk* (H.K.). Lower Shire, elephant marsh, especially on the banks of the river, fls. and fr., February, 1887, *L. Scott* (H.K.).

22. **Sesbania hamata,**† n. sp.

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* **Sesbania Kirkii,** *Phillips et Hutchinson*, sp. nov. ; affinis *S. tetrapterae*, Hochst., sed foliis, fructus brevioribus foliolis numerosissimis majoribus inflorescentiis multifloris differt.

Caules leviter costati vel fere teretes, haud aculeati, tatis robusti, circiter 5–6 mm. crassi. *Folia* usque ad 30 cm. longa, inflorescentiae ultra duplo-longiora ; rachis primum parce pilosus, mox glaber vel inferne aculeis paucis instructus ; foliola usque ad 35-jugate, breviter petiolulata, elongato-oblonga vel lineari-oblonga, basi leviter inaequilatera, apice rotundata et mucronata, 2 ·5–3 ·5 cm. longa, circiter 5–6 mm. lata, supra punctis nigris minutis maculata, ceterum glabra, nervis lateralibus subdistictis ; stipulae persistentes, lanceolatae vel lineari-lanceolatae, acute acuminatae, 1 cm. longae, intra pubescentes ; stipellae distinctae, subulatae, circiter 1 mm. longae. *Inflorescentia* pluriflora, racemosa, gracilis, usque ad 14 cm. longa ; pedunculi graciles, basin versus latiores et aculeis numerosis subulatis patulis instructi ; bracteae persistentes, pedicellis longiores, lineari-lanceolatae, acutissimae, 5–6 mm. longae, parce ciliatae ; pedicelli circiter 4 mm. longi, graciles, glabri, apice bracteolis calyce dimidio brevioribus instructis. *Calyx* campanulatus, basi turbinatus, 4 mm. longus, lobis triangularibus 5 circiter 1 mm. longis minute ciliolatis. *Petala* ut in *S. tetrapterae*, Hochst. (supra). *Fructus* foliis multo brevior, circiter 15 cm. longus et fere 1 ·5 cm. latus, basi 1 ·5 cm. stipitatus, apice acutissime rostrato-acuminatus, late 4-alatus. *Semina* matura non visa.

† **Sesbania hamata,** *Phillips et Hutchinson*, sp. nov. ; affinis *S. tetraptera* Hochst., sed caulibus aculeis hamatis ornatis inflorescentis plurifloris differt.

Caulis longitudinaliter costatus, aculeis hamatis. *Folia* 9–18 cm. longa ; rachis interdum aculeis paucis ornatus ; foliola 14–20-jugate, subsessilia, oblonga vel lineari-oblonga, apice rotundata, distincte mucronata, 1 ·2–2 ·7 cm. longa, 2 ·5–6 mm. lata, supra dilute viridia, glabra ; stipulae persistentes, lineis rubro-brunneis striatae, 0 ·6–1 cm. longae, oblique lanceolatae, acuminatae, glabrae. *Inflorescentia* axillaris, racemosa, 9–11 cm. longa, 6–9-flora, folio subtendente circiter aequilonga ; pedunculi inferne aculeis numerosis hamatis instructi ; bracteae persistentes, circiter 5 mm. longae, lanceolatae, acuminatae, acutae, leviter ciliatae ; bracteolae bracteis similes sed breviores ; pedicelli 0 ·9–1 ·5 cm. longi, glabri *Calycis tubus* 3 mm. longus, 4 mm. latus, campanulatus, glaber, dentibus 1 mm. longis ovatis acutis glabris. *Vexillum* maculatum, 1–2 cm. longum, 1 ·3 cm. latum, transverse oblongum, ungue 3 mm. longo ; alae 1 ·25–1 ·3 cm. longae, 4 mm. latae, oblongo-ovatae, superne rotundatae, ungue lineari circiter 3 mm. longo et dente recurvato ; carina 1 ·2 cm. longa, obtusa, ungue 5 mm. longo. *Tubus staminalis* 4 mm. longus, 3 mm. latus, filamentis superne arcuatis liberis ; stamen liberum 8 mm. longum. *Ovarium* subsessile, 8 mm. longum, 4-alatum, glabrum ; stylus 3 mm. longus, ab ovario sub angulo 45° divergens, pubescens, stigmate capitato. *Fructus* immaturi usque ad 9 ·5 cm. longi, 4 ·5 mm. lati, lineares, 4-alati, stylo persistente coronati.

Stem with longitudinal ridges, covered with hook-like prickles. *Leaves* 9–18 cm. long; rachis sometimes with a few hook-like prickles on the lower half; leaflets 14–20 pairs, subsessile, oblong or linear-oblong, rounded at the apex, distinctly mucronate, 1·2–2·7 cm. long, 2·5–6 mm. broad, pale green above, glabrous, with the mid-rib distinct beneath; stipules persistent, striped with reddish-brown marks, 0·5–1 cm. long, obliquely lanceolate, acuminate, glabrous. *Inflorescence* an axillary raceme 9–11 cm. long, 6–9-flowered, about as long as the subtending leaf, the lower half of the peduncle covered with numerous hook-like prickles; bracts persistent, about 5 mm. long, lanceolate, acuminate, acute, slightly ciliate; bracteoles similar to the bracts but a little shorter; pedicels 0·9–1·5 cm. long, glabrous. *Calyx-tube* 3 mm. long, 4 mm. broad, campanulate, glabrous; teeth 1 mm. long, ovate, acute, glabrous. *Vexillum* spotted, 1·2 cm. long, 1·3 cm. broad, transversely oblong, with a claw 3 mm. long, widening from the base upwards. *Alae* 1·25–1·3 cm. long, 4 mm. broad, oblong-ovate, rounded above, with a linear claw about 3 mm. long and a downward projecting tooth from the limb forming a loop with the claw. *Carina* 1·2 cm. long, obtuse, with a linear claw 5 mm. long, and with an acute tooth projecting at right angles to the limb and forming a horseshoe-shaped loop with the claw. *Staminal sheath* 4 mm. long, 3 mm. broad, with the upper half of the free filaments arcuate; free stamen 8 mm. long, dilated at the base above a short bent claw. *Ovary* subsessile, 8 mm. long, four-winged, glabrous; style 3 mm. long, bent almost at right angles to the ovary, pubescent; stigma capitate. *Young fruits* up to 9·5 cm. long, 4·5 mm. broad, linear, four-winged, tipped with the persistent style.

SOUTH AFRICA: Transvaal: Moist places near the Brak River, 2800 ft., 9th March, 1894, *Schlechter* 4620.

We have seen only one specimen of this apparently distinct species—in the Bolus Herbarium, Capetown. It extends the distribution of the group *Tetrapterae*, formerly only known by the solitary species (*S. tetraptera*) from the Nile districts, through the Zambezi Basin (*S. Kirkii* and *S. Rogersii*) into the sub-tropical Transvaal.

23. **Sesbania Rogersii** * n. sp.

Branched or unbranched plants 30–69 cm. high. *Stem* ribbed, covered with prickles, otherwise glabrous. *Leaves* 1·5–6 cm. long; rachis 3–4 cm. long, subterete; leaflets less than ten pairs, subsessile, 0·5–1·3 cm. long, 2–4 mm. broad, oblong, obtuse, shortly and bluntly mucronate, punctate above with minute black dots, otherwise glabrous, with the mid-rib distinct below; stipules setaceous, 4·5 long. *Inflorescence* an axillary raceme, 2–5 cm. long, 1–4-flowered, longer or shorter than the subtending leaf; peduncle with a few short prickles at the base; bracts 5 mm. long, lanceolate, acuminate, deciduous; bracteoles similar, soon falling off; pedicels 0·5–1·2 cm. long, glabrous. *Calyx-tube* 4 mm. long, campanulate, glabrous; teeth about 1 mm. long, ovate, acute, minutely ciliolate. *Vexillum* mottled, 1–1·3 cm. long, 7–8 mm. broad, obovate, with a linear claw

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* **Sesbania Rogersii,** *Phillips et Hutchinson*, sp. nov.; affinia *S. hamatae*, Phillips et Hutchinson, sed foliolis, paucijugis inflorescentiis 1–3-floris, tubo staminorum filamentorum partibus liberis longiore differt.

Plantae simplices vel ramosae usque ad 30–70 cm. altae; caulis costatus, aculeis ornatus, ceterum glaber. *Folia* 1·5–6 cm. longa; rachis 3–4 cm. longus, subteres; foliola 5–8-juga, subsessilia, 0·5–1·3 cm. longae, 2–4 mm. lata, oblonga, obtusa, breviter et obtuse mucronata, supra minute nigro-lepidotis; stipelae setaceae, 4·5 cm. longae. *Inflorescentia* axillaris, racemosa, 2–6 cm. longa, 1–4-flora, folio subtendente longior vel brevior; pedunculi basin versis aculeis brevibus instructi; bracteae 5 mm. longae, lanceolatae, acuminatae, deciduae; bracteolis similibus mox deciduis; pedicelli 0·5–1·2 cm. longi, glabri. *Calycis tubus* 4 mm. longus, campanulatus, glaber, dentibus circiter 1 mm. longis ovatis acutis minute ciliolatis. *Vexillum* irregulariter maculatum, 1–1·3 cm. longum, 7–8 mm. latum obovatum, ungue lineari 2–4 mm. longo apice bifidenticulato. *Alae* 1·3–1·4 cm. longae, 3 mm. latae, oblongae, obtusae, ungue lineari 3 mm. longo dente reflexo; carina 1·3–1·5 cm. longa, obtusa, concava, ungue 5–8 mm. longo lineari. *Tubus staminalis* 1–1·3 cm. longus basi 1·5–2 mm. latus, antheris 0·5 mm. longis, oblongis. *Ovarium* breviter stipitatum, 1·1–1·2 cm. longum, 4-alatum; stylus 3–3·5 mm. longus, arcuatus, apicem versus pubescens, stigmate parvo. *Fructus* 9–15 cm. longi, 1·1–1·2 cm. lati, lineares, acuminati, late 4-alati, medio pallidiores. *Semina* atrorubrobrunnea, 5 mm. longa, 2·5 mm. lata oblonga, utrinque fere truncata, glabra.

2–4 mm. long and two raised ridges above the claw. *Alae* 1·3–1·4 cm. long, 3 mm. broad, oblong, obtuse, with a linear claw 3 mm. long and a short downward projecting tooth. *Carina* 1·3–1·5 cm. long, obtuse, concave, with a linear claw 5–8 mm. long, and a projecting tooth almost at right angles to the limb. *Staminal sheath* 1–1·3 cm. long, 1·5–2 mm. broad at the base; free portion of the filaments shorter than the tube, arcuate; anthers 0·5 mm. long, oblong; free stamen bent near the base, but not swollen. *Ovary* shortly stipitate, 1·1–1·2 cm. long, four-winged; style 3–3·5 mm. long, arcuate, pubescent near the apex; stigma small. *Fruit* 9–15 cm. long, 1·1–1·2 cm. broad, linear, acuminate, broadly four-winged, with a lighter coloured band in the middle of the valves. *Seeds* dark reddish-brown, 5 mm. long, 2·5 mm. broad, oblong, almost truncate at both ends, glabrous.

TROPICAL AFRICA: Rhodesia: Victoria Falls, April, *Flanagan* 3109; North-West Rhodesia, without locality, *Rogers* 8747.

This is a very peculiar species with exactly the appearance of *S. aculeata* in regard to its vegetative and floral characters, but with fruits broadly four-winged as in *S. tetraptera*. It apparently provides a link between the two sections of the genus.

THE
NATAL SPECIES OF THE SAPINDACEAE.

By E. P. Phillips, M.A., D.Sc., F.L.S., Botanist in Charge of the
National Herbarium, Pretoria.

During a short stay in Durban in January, 1919, I saw for the first time, in their native state, species of *Sapindaceae* growing in the Stellabush. This led me to make an examination of the material in the Natal Herbarium, and at the same time I took the opportunity of describing the species. To make the records more complete than it was possible to do from the material in the Natal Herbarium alone, all the Natal specimens in the Bolus Herbarium and Cape Government Herbarium at Capetown and the National Herbarium, Pretoria, were examined. This has added considerably to the Natal localities in which the species occur.

Twelve genera of the order *Sapindaceae* have been recorded from South Africa, and of these nine occur in Natal. Wood, in his "Handbook to the Natal Flora" (1907), cites sixteen Natal species, but he eventually dropped *Schmidelia natalensis* in his "Revised List of the Natal Flora." Of the fifteen species mentioned by Wood, only ten are represented in the Natal Herbarium, and of those unrepresented I have not seen specimens from Natal in any other herbarium.

The examination of the material has brought to light an undescribed *Bersama* which occurs in Natal, and I am of opinion that *Bersama tysoniana* also occurs there, though I have seen no Natal specimen.

KEY TO THE GENERA.

- Stamens eccentric. Fruit bladdery. A twiner.......... *Cardiospermum.*
- Stamens not eccentric. Fruit membranous, fleshy, coriaceous, or winged.
  - Trees or shrubs.
  - Whole plant densely villous with stellate hairs; leaflets deeply incised.......... *Melianthus.*
  - Plants most glabrous; leaves or leaflets never deeply incised.
    - Leaves broadly ovate, palmately lobed; flowers scarlet.......... *Greyia.*
    - Leaves or leaflets lanceolate or elliptic; flowers greenish or whitish.
      - Leaves simple.
        - Fruit almost globose, coriaceous.......... *Allophylus.*
        - Fruit flattened with membranous wings.......... *Dodonaea.*
      - Leaves compound.
        - Leaflets unequal-sided; rachis with broad or narrow wings.
          - Young branches, leaf rachis, and inflorescence densely tomentose.......... *Hippobromus.*
          - Plant glabrous or almost so.......... *Pteroxylon.*
        - Leaflets not unequal-sided; rachis not winged, or only winged in the uppermost segment.
          - Leaves trifoliate; sepals glabrous, pedicels 1 mm. long.......... *Allophylus.*
          - Leaves pinnate, if trifoliate then pedicels 1 cm. long; sepals hairy.
            - Inflorescence a panicle up to 43 cm. long.......... *Sapindus.*
            - Inflorescence a raceme up to 17 cm. long.......... *Bersama.*

CARDIOSPERMUM Linn.

C. halicacabum Linn.

A herbaceous climber. *Stems* deeply five-furrowed with prominent ridges, scantily pubescent. *Leaves* 3–6 cm. long, trifoliate, each leaflet of the first order digitately divided into three leaflets of the second order ; petiole 1·5–1·8 cm. long, furrowed, pilose ; petiole of leaflets 8–11 cm. long, similar to the petiole of the leaf ; ultimate leaf-segments 1·5–2·5 cm. long, 0·5–1·3 cm. broad, ovate or ovate-lanceolate, acute, hirsute above, glabrous beneath except on the veins, with the margins deeply cut into 2–3 lobes. *Inflorescence* a compound umbel with three principal peduncles, axillary ; primary peduncle 3–7·2 cm. long, four-angled, pilose, and bearing at the apex two spirally-coiled tendrils ; secondary peduncles 8–1·7 cm. long, scantily pubescent. *Sepals* unequal ; the smaller 2 mm. long, 2 mm. broad, ovate, rounded above, glabrous ; the larger 5 mm. long, 2–5 mm. broad, obovate, obtuse. *Petals* similar to the larger sepals. *Stamens* eccentric ; staminal tube 1–5 mm. long ; free portion of filaments 2·5–3 mm. long, linear, glabrous, sometimes ciliated ; anthers 0·75 mm. long, oblong. *Ovary* 3 mm. long, eccentric, consisting of three carpels with a broad dorsal wing and a narrow ventral wing ; style none ; stigmas three, ovate, concave. *Torus* between the stamens and ovary produced into two blunt lobes 5 mm. long. *Fruit* 2–3-celled bladdery capsule with a single seed in each cell ; the valves not veined and pubescent with bulbous base hairs. *Seeds* black, 4 mm. long, 3·5 mm. broad, somewhat globose, glabrous. *Sonder in Harv. and Sond.*, Fl. Cap., 1, 237, *Bot. Mag.*, *t.* 1049.

Natal : Verulam, March, *Wood* 483, and in *Colonial Herb.* 6795, without locality, *Sanderson*, *Gueinzuis.*

Distribution : Rhodesia, Pondoland, Transvaal, Bechuanaland Protectorate.

MELIANTHUS Linn.

M. villosus Bolus.

A herbaceous shrub. All parts densely covered with stellate hairs. *Branches* tomentose. *Leaves* petioled, compound, paripinnate, 5–7-jugate, 8–19 cm. long ; petiole 3·2–5·5 cm. long, densely villous ; leaflets 2·5–7·5 cm. long, 6–3 cm. broad, lanceolate, subacute, slightly narrowed at the base, densely villous, with the margins deeply and acutely serrate ; stipules 2·2 cm. long, 4 mm. broad, ovate-lanceolate, long acuminate, acute, densely villous. *Inflorescence* a terminal raceme 28 cm. long. *Peduncle* 12 cm. long, densely villous. *Bracts* 2·3 cm. long, 1·2 cm. broad, ovate, long acuminate, pubescent. *Pedicels* 2 cm. long, terete, villous. *Sepals* unequal ; lateral sepals 2·6 cm. long, 1·3 cm. broad, elliptic, obtuse, tomentose within and without ; anterior sepal 1·6 cm. long, 1 cm. broad, boat-shaped, ovate in outline, long acuminate, densely tomentose. *Petals* 1·9 cm. long, 2–3 mm. broad, linear, three-lobed above, densely pilose on the upper half, with the middle lobe tongue-shaped ; the lateral lobes smaller, sometimes rudimentary. *Disc* in the form of flat fleshy glands 4–5 mm. long, 2 mm. broad, truncate at the apex. *Filaments* 6–9 mm. long, subterete, pilose ; anthers 4·5 mm. long, 2 mm. broad, oblong. *Ovary* 4 mm. long, pyramidal in outline, four-angled, glabrous, four-celled, each cell containing many ovules ; style 5 mm.long, subterete, somewhat falcate, narrowing to a blunt point, pubescent ; stigma simple.

Natal : Rocky Hill, South Downs, 4000–5000 ft., December, *Wood* 1008, 4376, and in *Natal Govt. Herb.* 5133.

Distribution : Elands River Valley, near Mont-aux-Sources.

M. insignis, O. Kuntze. I have not seen specimens of this species, but from the short description given by Kuntze (Rev. Gen. III, 43) it may possibly be the same as *M. villous* Bolus.

GREYIA HOOK. AND HARV.

G. Sutherlandi Hook. and Harv.

A moderately sized tree (*Wood*). *Branches* glabrous. *Leaves* simple, petioled, 4–10 cm. long; petiole 1–4 cm. long, somewhat compressed, glabrous, dilated and amplexicaul at the base; lamina 3–7 cm. long, 2–8 cm. broad, ovate, obtuse, somewhat cordate at the base, glabrous, 8–9-lobed with the lobes coarsely toothed, palmatinerved with distinct veins. *Inflorescence* a dense raceme, 7–11 cm. long, 3·5–5 cm. broad. *Bracts* 1 cm. long, 5 cm. broad, lanceolate, obtuse. *Pedicels* 1·5 cm. long, terete, glabrous. *Sepals* 5 mm. long, 3 mm. broad, ovate, obtuse, glabrous, connate at the base. *Petals* red, 1·15 cm. long, 5·5 mm. broad, oblong, concave, rounded at the apex, glabrous, shortly ciliated. *Disc* basin-shaped, with a rim 2 mm. deep and produced into ten processes 2 mm. long, each bearing a flattened anther-like structure at the apex. *Filaments* reddish, 9·2 cm. long, terete, glabrous; anthers 3 mm. long, oblong. *Ovary* 7 mm. long, 3·5 mm. broad, ovoid, subapocarpus, five-celled, each cell containing numerous ovules; style 5 mm. long, gradually narrowed above, minutely five-toothed at the apex, glabrous. *Harv. Thes. Cap. t.* 1, *Harv. in Harv. and Sond. Fl. Cap. II*, 309; *Wood, Natal Plants t.* 373.

Natal: Polela, June, *Fernando*, 83; and *in Natal Govt. Herb.* 10470; Ixopo, September, *Fannin in Natal Herb.* 16241; Inanda, 2000 ft., *Wood in Natal Govt. Herb.* 95; Van Reenens Pass, 5800 ft., November, *Wood* 4691; without precise locality, *Sutherland.*

DISTRIBUTION: Orange Free State, Tembuland, Stutterheim, Transvaal.

ALLOPHYLUS LINN.

Leaves simple.. *monophylla.*
Leaves trifoliate.
    Leaflets lanceolate; petiole glabrous; stigmas linear.................. *erosa.*
    Leaflets mostly elliptic; petioles pubescent; stigmas ovate........... *africana.*
    Leaflets obovate or oblanceolate; petioles pubescent; stigmas linear... *decipiens.*

A. monophyllus Radkl.

A large spreading shrub or small tree, 10–30 ft. high and up to 12 in. stem diameter (ex *Sim*). *Branches* with minute mealy pubescence and greyish bark. *Leaves* simple, petioled, 2·5–2·3 cm. long, 2·5–8 cm. broad, elliptic, lanceolate, or ovate, acuminate, subobtuse, slightly narrowed or more rarely subrotund at the base, glabrous above and beneath, sometimes with tufts of hairs in the angles of the lateral veins beneath, darker above, with coarsely serrated margins; petiole 1·3–5 cm. long, terete, minutely pubescent or almost glabrous. *Inflorescence* a raceme, 4–17 cm. long, sometimes the flowers in groups of two on short secondary peduncles. *Peduncles* 1·5–5 cm. long, terete, minutely pubescent or glabrous. *Pedicels* about 1·5 cm. long. *Sepals* unequal, the smaller 1·5 mm. long, 1 mm. broad, elliptic, rounded above, deeply concave, glabrous; the larger 2 mm. long, 1·75 mm. broad, subrotund, concave, glabrous. *Petals* 2 mm. long, spathulate, densely bearded within. *Filaments* 2·5 mm. long, linear, pilose; anthers 4 mm. long, oblong. *Ovary* 1 mm. long, 2 mm. broad, didymous, pubescent; style 0·75 mm. long, terete, glabrous; stigmas 0·75 mm. long, linear, divergent. *Fruit* 9 mm. long, 7 mm. in the diameter, obovate in outline, slightly narrowed at the base, glabrous. *Schmidelia monophylla, Presl. Fl. Cap. I*, 239. *Sim, Forests and Forest Floras*, 170, *Pl. XXXII, Fig.* 3, *S. dregeana, Sond. in Harv. and Sond. Fl. Cap. I*, 239.

Without precise locality, Gerrard and McKen. 525, and *in Natal Govt. Herb.* 726.

Natal: Inanda, April, *Wood*, 481, and *in Colonial Herb.*, 5678, Ifafa, August (in fruit), *Lansdell in Natal Herb.* 16126; Imont, *Wood*, 2468; edge of bush at Spring Grange, c., 800 ft., April, *Wood, in Natal Govt. Herb.*, 11248; without locality, *Pappe.*

Zululand: Qudeni Forest, 6000 ft., February, *Davis* 118, and *in Natal Govt. Herb.*, 8700.

DISTRIBUTION: Komgha, Kentani, East Pondoland.

A. erosus Radkl.

A shrub 4–12 ft. high (ex *Sim*). *Branches* glabrous with wrinkled greyish bark. *Leaves* petioled, trifoliate, 6–12 cm. long, petiole 2–3 cm. long, channelled above, glabrous ; leaflets sessile, 3–8 ·5 cm. long, 9–2 ·6 cm. broad, lanceolate, obtuse, narrowed at the base, glabrous, minutely punctate beneath, with the margins coarsely and bluntly serrate. *Inflorescence* an axillary panicle, 4–7 cm. long, the flowers ultimately cymose in groups of 2–4 ; peduncle grooved, minutely pubescent or almost glabrous. *Pedicels* 1 mm. long, glabrous. *Sepals* unequal, 1 mm. long, 0 ·75 mm. broad, obovate, rounded above, concave, glabrous. *Petals* white, 1 mm. long, 0 ·75 mm. broad, obovate, subcrenate and almost truncate at the apex, densely bearded within. *Filaments* (in young flowers) 0 ·75 mm. long, linear, pilose ; anthers 5 mm. long, oblong in outline. *Ovary* 1 mm. long, 1 ·5 mm. broad, obovate, in outline, pubescent ; style 1 mm. long, terete, glabrous ; stigmas 1 mm. long, linear, obtuse, divergent. *Fruit* 5 mm. long, 5 mm. in diameter, globose, narrowed at the base, finely and scantily pubescent, at length glabrous. *Schmidelia erosa Arn. Sond. and Harv. Fl. Cap. I,* 239. *Sim, Forests and Forest Flora,* 169, *Pl. XXXII, Fig.* 1. *S. natalensis, Sonder in Harv. and Sond. Fl. Cap. I,* 239.

Natal : Back Beach Bush, near Durban, 20 ft., April, *Wood, in Natal Govt. Herb.,* 11249. Durban, April, *Wood* 898, 7841, 10964, and *in Colonial Herb.,* 5693. Catos Creek, May (in fruit), *Wood in Natal Govt. Herb.,* 2469. Umgeni, August (in fruit), *Native Collector in Natal Herb.,* 16218. Port Shepstone, April, *Brown* 422 ; without locality, *Saunders* ; Berea, *Wood.*

Sim states : " Abundant along the coast, and especially on the coast dunes from the Fish River to Natal ; not found inland. This species is a shrub 4–12 ft. high and often forms a large proportion of the sea scrub. It stands sea winds where most other shrubs fail, close to the sea. Its timber is not used and is seldom heavy enough for economic purposes."

Distribution : East London.

A. melanocarpus Radkl.

A shrub or small tree reaching 20 ft. or more in height (ex *Wood*). *Branches* minutely pubescent, at length becoming glabrous, with greyish bark. *Leaves* petioled, trifoliate (4 ·5), 22 cm. long ; petiole 2 ·2–8 ·5 cm. long, channelled above, minutely and densely pubescent ; leaflets darker above, paler beneath, shortly petioled, 2 ·5–12 ·5 cm. long, 1 ·2–4 ·5 cm. broad, elliptic, elliptic-lanceolate, ovate or ovate-lanceolate, acuminate, obtuse, rounded or more usually narrowed at the base, pubescent above and beneath, especially on the veins, sometimes almost glabrous, with a prominent mid-rib beneath and 7–11 lateral veins forming an acute angle with the mid-rib and distinct above, sometimes with distinct tufts of hairs in the angles between the mid-rib and the lateral veins on the under surface. *Inflorescence* an axillary panicle, 3 ·5–12 cm. long, with the flowers ultimately in cymose groups of 3–5 on short peduncles. *Peduncle* 2–4 cm. long, channelled, densely pubescent, branches of inflorescence similar to the peduncle. *Sepals* unequal, the smaller 1 mm. long, 0 ·75 mm. broad, more or less rotund, deeply concave, glabrous ; the larger 1 mm. long, 1 ·5 mm. broad, ovate, rounded above, deeply concave, glabrous. *Petals* 1 ·5 mm. long, spathulate, bearded. *Filaments* 5 mm. long, linear, densely ciliated ; anthers 5 mm. long, somewhat obovate in outline. *Ovary* 7·5 mm. long, 1 ·5 mm. broad, obovate in outline, pubescent, two locular, with a single ovule in each loculus ; style 1 mm. long, terete ; stigmas, two, reflexed, 0 ·75 mm. long, ovate, acuminate, acute. In male flowers filaments 1–1 ·5 mm. long, linear, ciliated ; anthers, 0 ·5 mm. long, subglobose. *S. africana D.C. Harv. and Sond. Fl. Cap.* I, 238 ; *Wood, Natal Plants, Pl.* 572 ; *Sim, Forests and Forest Flora,* 170, *Pl. XXXIII, Fig.* 4. *S. melanocarpa, Arn. in Hook. Journ. Bot.* III, 153 ; *Sonder in Harv. and Sond. Fl. Cap. I,* 238. *S. leucocarpa, Arn. in Hook Journ. Bot. III,* 153 ; *Sonder in Harv. and Sond. Fl. Cap. I,* 238.

Natal: Near Phoenix Crossing, 400 ft., February, *Wood in Natal Govt. Herb.*, 1373. Berea, Durban, March, *Wood*, 11804, and *in Natal Govt. Herb.*, 13648. Woods near Durban, 150 ft., January, *Wood*, 22; Port Natal, *Drege; Gueinzius*, without precise locality, *Gerrard and McKen.*, 525, *and in Natal Govt. Herb.*, 94; in woods at Inanda, 1800 ft., January, *Wood*, 827, and in *Natal Govt. Herb.*, 5884. Ixopo, 4000 ft., February, *Schlechter*, 6648.

DISTRIBUTION: Rhodesia, Pondoland, Kentani, Swaziland.

A. decipiens Radkl.

Young branches pubescent, becoming glabrous with age. *Leaves* petioled, trifoliate 4–8·5 cm. long; petiole 1–3 cm. long, semiterete, pubescent; leaflets 1–6 cm. long, 0·4–2·1 cm. broad, obovate or oblanceolate, obtuse, sometimes rounded at the apex, cuneate at the base, entire or sometimes remotely crenate, glabrous above and beneath or pubescent on the mid-rib and primary lateral veins. *Inflorescence* in stalked axillary lax racemes, 4–7 cm. long, stalk 1–3 cm. long, pubescent; rachis pubescent. *Larger sepals* 1·25 mm. long, 1·75 mm. broad, more or less broadly oblong, concave; smaller sepals 1·5 mm. long, oblong, deeply concave. *Petals* 1·5 mm. long, spathulate, truncate or 2–3-lobed at the apex, with 1–2 processes on the inner face, ciliate. *Filaments* 0·5 mm. long, ciliate; anthers 0·5 mm. long, oblong in outline. *Ovary* 0·5 mm. long, didymous, pubescent; style divided to the middle; stigmas 0·75 mm. long, linear, slightly recurved. *Fruit* 6 mm. long, 6 mm. in diameter, globose, glabrous. *Schmidelia decipiens, Arn. in Harv. and Sond., Fl. Cap. I*, 239.

Not seen from Natal; stated by Wood to have been collected there by Dregé.

Schmidelia rehmanniana, Szyszy., collected by Rehmann (No. 9038) near Durban, I have not seen, but from the description given suspect it to be *A. melanocarpus* Radkl.

DISTRIBUTION: Graaff-Reinet, Knysna, Kingwilliamstown, Albany, Uitenhage, Stockenstroom, Somerset East, Swellendam.

DODONEA LINN. F.

D. viscosa Linn.

Branches glabrous, with reddish bark. *Leaves* sessile, 4–9·5 cm. long, 1–3 cm. broad, oblanceolate, rounded and obtuse or shortly acuminate and subobtuse at the apex, narrowed at the base, glabrous, gland-dotted above and beneath, with the mid-rib prominent beneath, entire. *Inflorescence* a terminal panicle, peduncle glabrous, glandular. *Pedicels* 5–9 mm. long, glandular. *Sepals* unequal, 2·5–3 mm. long, 0·75–1·5 mm. broad, lanceolate or elliptic, obtuse, glandular without, usually three-veined. *Petals* absent. *Filaments* 0·5 mm. long; anthers 1·5 mm. long, 0·75 mm. broad, oblong. *Ovary* 1·5 mm. long, 1·5 mm. in diameter, globose, densely glandular, two-locular with two ovules in each loculus; style 2 mm. long, thick, terete, glabrous, bifid at the apex. *Fruit* 1 cm. long, 1·5 cm. broad, transversely oblong, two-winged, two-celled with two seeds in each cell. *Seeds* black, 1·5 mm. long, 1·5 mm. broad, discoid, glabrous. *Sonder in Harv. and Sond. Fl. Cap. I*, 242.

Natal: Shores of Natal Bay, 50 ft., September, *Wood*, 7928, and *in Natal Govt. Herb.*, 2246; near Durban, September, *Wood*, 1928, 484; and in *Colonial Herb.*, 6794.

I find that this species differs from the generic description by having a two-locular ovary.—(*E. P. P.*)

HIPPOBROMUS E. & Z.

H. alata E. & Z.

A small tree, evergreen or nearly so, 10–30 ft. high (ex *Sim*). *Branches* minutely and densely pubescent on the young parts, becoming almost glabrous on the older parts. *Leaves* petioled, paripinnate, 3–6-jugate; petiole 0·7–2 cm. long, terete or somewhat flattened above, densely tomentose; rachis winged, tomentose; leaflets 1–3·5 cm. long, 0·7–2 cm. broad, obovate, obtuse, narrowed at the base, unequal sided, giving the leaflet a falcate appearance, darker above than beneath, glabrous, usually pubescent on the mid-rib above and beneath, coarsely serrate usually on the convex side, sometimes entire, with the mid-rib prominent beneath. *Inflorescence* an axillary raceme shorter than the leaves, sometimes grouped into a dense terminal panicle. *Pedicels* 2 mm. long, terete, densely tomentose. *Sepals* unequal, 2·5–3 mm. long, 1·75–2·5 mm. broad, elliptic or subrotund, densely tomentose without, ciliated. *Petals* 3 mm. long, 2·5 mm. broad, obovate, glabrous. *Disc* annular. *Filaments* 2·5–5 mm. long, linear, glabrous, tapering gradually from the base upwards; anthers 1·5 mm. long, elliptic, in outline. *Ovary* rudimentary, tomentose. *Fruit* 0·7 mm. long, 1 cm. in diameter, three-celled with a single seed in each cell, pilose. *Seeds* 5 mm. long, 5 mm. in diameter, almost globose, somewhat flattened or channelled on the inner face, glabrous. *Sonder in Harv. and Sond. Fl. Cap.* I, 241. *Sim, Forest and Forest Flora,* 172, *Pl. XXXIV.*

Natal: Stellabush, Durban, September, *Van der Bijl in Natal Herb.*, 16243, 16244; without precise locality or collector in *Natal Govt. Herb.*, 93; Verulam, *Wood,* 606.

DISTRIBUTION: Port Elizabeth, Kentani, Somerset East, Uitenhage, Albany, Stockenstroom.

PTAEROXYLON, E. & Z.

P. utile E. & Z.

Branches glabrous, youngest with greyish bark, turning dark brown in older branches. *Leaves* petioled, pinnately compound, 6–7-jugate, 3–12 cm. long; petiole 1–2·5 cm. long, minutely pubescent, furrowed above; leaflets 1–3 cm. long, 0·5–1·5 cm. broad, oblong, obtuse or retuse at the apex, sometimes shortly mucronate, unequal at the base, entire, with the mid-rib prominent above and beneath and the lateral veins distinct, glabrous. *Inflorescence* racemose, massed at the ends of the branches, about 3 cm. long. *Peduncle* pubescent. *Flowers* often in three-flowered cymes on the raceme. *Pedicels* 4 mm. long, pubescent, articulated at the base. *Bracts* 2 mm. long, lanceolate-linear. *Calyx* 1·5 mm. long, ovate, subobtuse, pubescent. *Petals* 5 mm. long, 2 mm. broad, oblong, obtuse, glabrous. *Filaments* 3 mm. long, linear, gradually narrowing from the base upwards; anthers 1·5 mm. long, elliptic in outline, flattened, cordate at the base. In female flowers: *Ovary* 1·5 mm. long, 1·5 mm. broad, almost circular in outline, somewhat flattened, pubescent. *Style* 1 mm. long, terete, pubescent; stigma bilobed, discoid. *Fruit* 1·3 cm. long, oblong in outline, somewhat compressed, dehiscing into two valves; valves deeply keeled, glabrous.

No specimen from Natal seen.

DISTRIBUTION: Uitenhage, Somerset East, Komgha.

SAPINDUS, LINN.

S. oblongifolius Sond.

Shrub or small tree 6–10 ft. high (ex *Wood*). *Branches* minutely pubescent. *Leaves* petioled, paripinnate, 4–11-jugate, 18–26 cm. long; petiole 5–11 cm. long, terete, glabrous or sparsely pilose; leaflets subsessile, 3·5–12·5 cm. long, 1·5–4 cm. broad, lanceolate, rarely elliptic, obtuse, glabrous, with the mid-rib prominent beneath, entire. *Inflorescence* a panicle up to 43 cm. long. *Peduncle* pubescent, the main axis of the panicle and branches densely tomentose. *Pedicels* 3 mm. long, terete, densely tomentose. *Calyx* 6 mm. long, 4 mm. broad, elliptic in outline, deeply concave, densely tomentose without, long-ciliated. *Petals* 6 mm. long, 3·5 mm. broad, spathulate, densely ciliated, with a flat claw appendage 1 mm. long and 2·25 mm. broad and densely ciliate arising from the inner face. *Filaments* 2·5 mm. long, linear, long-ciliated; anthers 1·5 mm. long, oblong. *Disc* deeply saucer-shaped with a rim 1·5 mm. high, thin, more or less triangular in outline with rounded angles. *Ovary* 3 mm. long, 4 mm. in diameter, sub-apocarpus, three-locular with a single ovule in each loculus, densely pilose. *In male flowers* the filaments are slightly longer and the ovary rudimentary, otherwise similar to the perfect flowers. *Wood, Natal Plants Pl.* 89. *Sim, Forests and Forest Flora,* 173, *Pl. XXXV. Sond. in Harv. and Sond. Fl. Cap. I,* 240.

Natal: Near Durban, 100 ft., *Wood*, 1917, and *in Natal Govt. Herb.*, 2213; Berea, Durban, 100–200 ft., May, *Wood*, 11869, and *in Natal Govt. Herb.*, 13053; Port Natal, *Saunderson* (?).

Wood states: "In the 'Flora Capensis,' Vol. I, 240, this plant is described as diœcious. We find, however, that it is certainly polygamous, and plants which in one season bear a larger number of perfect flowers, in another season bear male ones only, or with but very few perfect ones." In the Stellabush at Durban I saw trees well over 20 ft. high.—(*E. P. P.*)

DISTRIBUTION: Komgha.

BERSAMA, FRESEN.

Mid-rib on lower surface of leaf covered with long straight hairs.......... *Stayneri.*
Mid-rib quite glabrous.
  Leaves usually 2–3-jugate; leaflets obovate, usually rounded at the apex, obtuse.. *lucens.*
  Leaves usually 4-jugate; leaflets oblong-lanceolate, acuminate, acute.. *abyssinica.*

B. Stayneri Phillips.

Bark thick and rough. *Branches* glabrous, rough with longitudinal furrows. *Leaves* pinnate, petioled, 7–16 cm. long, 4–5-jugate; petiole 1–2 cm. long, very densely pilose; rachis densely pilose; leaflets 1·7–5·2 cm. long, 0·8–1·5 cm. broad, oblong-lanceolate or elliptic, acute and mucronate at the apex, rarely rounded, slightly cuneate at the base, the mid-rib deeply sunk on the under surface, which is frequently somewhat rugose, prominent beneath and with the lateral veins distinct beneath, glabrous above pilose or pubescent beneath, especially on the mid-rib. *Inflorescence* a shortly peduncled many-flowered raceme, 3·5–6·5 cm. long; peduncle 1–1·5 cm. long, very densely pilose. *Bracts* 3 mm. long, linear, tomentose. *Pedicels* 5 mm. long, terete, tomentose. *Calyx* 6 mm. long, densely tomentose, divided almost to the base. *Petals* 1·3 cm. long, 3 mm. broad, spathulate-linear, tomentose, reflexed in open flowers. *Filaments* 5 mm. long, semiterete, monadelphous and villous at the base. *Ovary* densely villous; style 3 mm. long, terete; stigma subglobose. *Fruit* 2·7–3 cm. long, dehiscing by four valves; valves woody, covered with woody protuberances. *Seeds* reddish in colour, 1·1 cm. long, 6 mm. in diameter, ellipsoid with a waxy yellow arillus at the base.

Natal: Without locality, *Stayner in Herb. Bolus*; Stinkwood Forest, Ingeli, Natal, May, *Chilvers in Herb. Forest Dept.*, 1518; Mkanzeni, Riversides, Natal, *Henkel in Herb. Forest Dept.*, 2421.

B. lucens Szysz.

A shrub 8–10 ft. high (ex *Wood*). *Branches* glabrous, with wrinkled greyish bark. *Leaves* petioled, compound, imparipinnate, 2–4-jugate, 10–20 cm. long; petiole 1·5–5·5 cm. long, glabrous, rarely pubescent; leaflets 1·8–9 cm. long, 1·3–4·5 cm. broad, obovate or obovate-elliptic, rarely elliptic, very rarely subacute, slightly narrowed at the base, glabrous, with the mid-rib distinct above, prominent beneath, and with thickened wavy margins. *Inflorescence* a lax axillary or terminal raceme, 6–14·5 cm. long, many-flowered; peduncle pubescent. *Pedicels* 0·4–1 cm. long, terete, densely tomentose with fine adpressed hairs. *Bracts* 0·5 mm. long, ovate, pubescent. *Calyx* gamosepalous; lobes 3–4 mm. long, 2 mm. broad, ovate or ovate-elliptic, obtuse, finely but densely pubescent without and with fine adpressed hairs within, ciliated; the two posterior lobes connate and bifid at the apex. *Petals* dull yellow, 8·5 mm. long, 2·5 mm. broad, above, oblong, obtuse, narrowed into an evident claw, pubescent. *Disc* unilateral. *Filaments* all connate at the base, 1 cm. long, terete, glabrous except at the; base the anterior filaments ciliated at the base and forming a tomentose shield 3 mm. long and 2·5 mm. broad; the posterior filaments ciliated and pubescent at the base; anthers 2·5 mm. long, 1·5 mm. broad, oblong. *Ovary* 1 mm. long, 1·5 mm. broad, subglobose, densely villous, four-locular with a single ovule in each loculus; style 7 mm. long, cylindric, pubescent on the lower half;

stigma globose, faintly lobed. *Fruit* 1·7 mm. long, 1·7 cm. in diameter, finely but densely pubescent, four-celled, each cell with a single seed, splitting into four valves when ripe. *Seeds* bright scarlet, 7 mm. long, 7 mm. in diameter, subglobose, wrinkled, flat on one side, convex on the other, with a fleshy yellow-green arillus. *Wood, Natal, Pl.* 88. *Sim, Forests and Forest Flora*, 175. *Journ. Bot. XLV, p.* 13. *Natalia lucens, Hochst., Harv. and Sond. Fl. Cap. I*, 369.

Natal: Umbilo, 20–100 ft., May, *Wood*, 12612, and *in Natal Herb.*, 14571; near Verulam, 100–200 ft., January, *Wood*, 10207, and *in Natal Govt. Herb.*, 11411; Durban Flats, near Umgeni, September, *Wood in Natal Herb.*, 2868; near Stamford Hill, *Wood;* Groenberg, February, *Wood*, 808; near Durban, 200-300 ft., March, *Wood*, 6307; without locality, *Saunders;* Palmiet, near Durban, 200 ft., February, *Wood*, 7392; Port Natal, *Gueinzius*.

DISTRIBUTION: Swaziland, Transvaal, Kentani, Pondoland, Komgha.

B. abyssinica Fresen.

A tree. *Leaves* petioled, 18–22 cm. long, pinnate; petiole 4–5 cm. long, terete, glabrous; rachis sometimes winged between the uppermost pair of leaflets; leaflets usually in four pairs, 2·5–4 cm. apart, 4–9 cm. long, 1·7–3·5 cm. broad, oblong-lanceolate or ovate-lanceolate, acuminate, acute, entire or the margins sometimes serrated in the upper half, glabrous. *Inflorescence* racemose, 10–20 cm. long on a woody peduncle 5–7 cm. long. *Calyx* campanulate, silky. *Petals* five, ligulate-spathulate, twice as long as the calyx, densely and finely silky, finally, reflexed. *Stamens* five; in the male flower nearly as long as the petals; filaments monadelphous, silky. *Capsule* about 1 cm. long, 1 cm. in diameter, subglobose, 3–4-valved, densely pubescent, without woody protuberances. *Seeds* 6 mm. long, black.

This description was drawn up partly from a fruiting specimen collected by *Schimper* in Abyssinia and partly from the description in the "Flora of Tropical Africa."

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Bothalia.

A RECORD OF
CONTRIBUTIONS
FROM THE
NATIONAL HERBARIUM
UNION OF SOUTH AFRICA
PRETORIA

Smithsonian Institution
SEP 1 9 1924
National Museum.

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SOUTH AFRICAN ASCOMYCETES
IN THE
NATIONAL HERBARIUM.

By ETHEL M. DOIDGE.

PART II.

51. **Aphysa Rhynchosiae** (Kalch & Cke.) Theiss et Syd.

Ann. Myc. XV (1917), p. 134.

Syn. *Stigmatea Rhynchosiae* Kalch. & Cke.; Syll. Fung. I, p. 543 (on *Rhynchosia gibba*, Inanda, Natal., leg. Wood).

Parodiella Schimperi P. Henn. Bull. Herb. Boiss., I, 1893, p. 118; Syll. Fung. XI, p. 260 (on *Rhynchosia elegans* and *Vigna* sp. Eritrea).

On *Rhynchosia gibba*, Umkomaas, Natal, 25.4.19, Bottomley [11884].

On *Rhynchosia* spp., Durban, 25.5.97, Medley Wood [356]; Durban, 15.6.15, Lansdell [9015]; Kentani, 29.9.15, Pegler (Pegler No. 2357) [9116]; Inanda, Medley Wood [9478]; Kowie, 15.7.19, Doidge [12362]; Howiesons Poort, 12.7.19, Doidge [12381].

On *Dolichos gibbosus*, Van Stadens Pass, 13.11.17, Doidge [10864].

Epiphyllous, forming spots 1–2 mm. diameter, which are made up of numerous minute black points. Each point represents a hemispherical, subcuticular perithecium, 170 μ in diameter and about 60 μ high. Free mycelium wanting. Basal line brown, thin, 0·5 μ thick, lying flat on the outer wall of the epidermis; the outer membrane convex, remaining covered by the cuticle, 6–7 μ thick, parenchymatous, without any decided radial orientation except at the periphery. Asci basal, somewhat converging towards the ostiole, sessile, aparaphysate, somewhat thickened round the apex, 42–48 × 12–15 μ, eight-spored. Spores distichous, ellipsoid, two-celled, not constricted, rounded at both ends, light, grey-brown, 7–10 × 4 μ.

52. **Catacauma Schotiae** n. sp.

On leaves of *Schotia speciosa*: Humewood, Port Elizabeth, 23.3.12, Doidge [2294].

Stromata epiphyllous, scattered, minute, black, convex, 0·3–0·4 mm. diameter, round or oval, unilocular. Loculus developing between the epidermis and the palisade tissue, and with its base resting on the latter which becomes concave, ellipsoid, 300–350 μ diameter, 100–120 μ high in the centre; epidermal clypeus black, opaque, 30–40 μ thick, and covered by thick cuticle which is 15–16 μ thick: the clypeus does not always extend over the whole length of the loculus, being 200–250 μ long, lateral and basal walls of loculus consisting of delicate hyphae which are laterally compressed. Asci paraphysate, oblong or ellipsoid, tapering somewhat to the rounded apex, eight-spored, sessile, 80–87 × 17–20 μ. Spores distichous, hyaline, continuous, ellipsoid, rounded at both ends, 20–24 × 6–7 μ.

Catacauma Schotiae Doidge, nov. sp.

Stromata epiphylla, sparsa, minuta, atra, convexa, subepidermales, 0·3–0·4 mm. diametro unilocularia. Loculli ellipsoidei, 300–350 μ diametro, 100–120 μ alti ; clypeo atro, opaco, 30–40 μ crasso. Asci paraphysati, cylindracei v. ellipsoidei, octospori, sessiles, 80–87 × 17–20 μ. Sporae distichae, hyalinae, continuae, ellipticae, utrinque rotundatae, 20–24 × 6–7 μ.

Hab. in foliis *Schotiae speciosae*, Port Elizabeth, 23.3.12, leg. Doidge [2294]

53. **Dictyochorella Andropogonis** n. sp.

On leaves of *Andropogon nardus*, Tugela Valley, near Goodoo, Natal, 16.5.20, Doidge [14104].

Stromata thickly strewn on the leaf surface, small, oval to elliptic, $\frac{1}{2}$–1 mm. long, visible on both surfaces, slightly convex, loculi mostly opening towards the upper leaf surface ; often a number of stromata arising close together become confluent and form streaks up to 5 mm. long in which the separate stromata can still be distinguished. Stromata with one or few loculi. Loculi occupying the whole of thickness of leaf, 190–240 μ diameter × 160–190 μ high. Clypeus over apex of loculi black, opaque, about 30 μ thick, extending considerably beyond loculus on each side : basal clypeus 20–25 μ thick ; when the loculus does not reach basal clypeus, then the intervening space is filled with brown hyphae ; lateral walls (and basal where there is no clypeus) up to 20 μ thick and composed of brown compact angular cells. Stylospores brown, oval, elliptic or pyriform ; with a central (?) vacuole, 8–10 × 3–4 μ. Asci paraphysate, cylindrical, rounded at apex, eight-spored, 80–90 × 12–13 μ. Spores distichous or obliquely monostichous, with three or occasionally four transverse septa, constricted at septa, tapering towards rounded at ends, two central cells broader than terminal ones and one or both with a somewhat oblique longitudinal septum, 15–17 × 6–7 μ, fuscous-olivaceous, sometimes only one central cell has a septum and it is then broader than the other.

Dictyochorella Andropogonis Doidge, n. sp.

Stromata dense disposita, minuta, elliptica v. suborbicularia $\frac{1}{2}$–1 mm. longa, in utraque foliorum pagina visibilia. Loculi uni v. pauci in quoque stromate, 190–240 diametro, 160–190 μ alti, clypeo amphigeno atro, opaco, circ. 30 μ crasso. Asci paraphysati, cylindracei, apice rotundati, octospori, 80–90 × 12–13 μ. Sporae distichae v. oblique monstichae, transverse 3-rare, 4-septatate, ad septa constrictae, loculis 1–2 plerumque mediis septo singulo longitudinale divisi, fuscae v. olivaceae, 15–17 × 6–7 μ.

Hab. in foliis *Andropogonis nardi*, Tugela Valley, Natal, 16.5.20, leg. Doidge [14104].

54. **Phaeodothis stenostoma** (Ell. et Tr.) Theiss et Syd.

Ann. Myc. XV (1917), p. 596.

Syn. *Phyllachora stenostoma* Ell. et Tracy, Journ. of Myc., 1890, p. 76; Syll. Fung. IX, p. 1029.

On *Panicum maximum*, Bluff, Durban, 7.7.11, Doidge [1611].

Stromata oval, about 600 μ long, 300–400 μ broad, or subcircular $\frac{1}{3}$–1 mm. diameter, very irregular in outline, usually visible on both sides of the leaf, often only on one side and surrounded by a small, pale ring, later forming elliptic groups $\frac{1}{2}$–1 cm. long and $\frac{1}{2}$ cm. broad. A dark epidermal clypeus is developed in both leaf surfaces. Loculi, flattened-spherical, often irregular in shape, mostly 170 μ diameter, 120–130 μ high, locular wall composed of delicate, light brown hyphae, fusing at the apex with the clypeus, 12–14 μ thick. Asci cylindrical, parietal, paraphysate, briefly pedicellate, 52–60 × 7–8 μ. Spores obliquely monostichous or subdistichous, oblong, club-shaped, fuscous, rounded at both ends, straight, 12–14 × 4–4$\frac{1}{2}$ μ, somewhat constricted at the septum.

55. **Phaeodothis Tristachyae** Syd.

Ann. Myc. X (1912), p. 41.

On leaves of *Tristachya leucothrix*, Mooi River, Natal, 15.4.11, Burtt-Davy [1470].

Stromata amphigenous, scattered or in short series, oblong or linear, ½–1 mm. long, flat, black, opaque; loculi numerous, minute, 100–150 μ diameter. Asci cylindrical, somewhat obtuse at the apex, 45–70 × 6–12 μ, eight-spored. Paraphyses numerous, filiform. Spores monostichous or distichous, fusiform, 1-septate, loculi equal, not or very slightly constricted, olivaceous-brown, 12–13½ × 3–4 μ, each cell 1–2 guttulate.

56. **Phyllachora Crotonis** (Cke.) Sacc.

Syll. Fung. II, p. 599; Ann. Myc. XV (1917), p. 523.

Syn. *Dothidea Crotonis* Cke., Grevillea X, p. 129.
Phyllachora crotonicola Rehm., Hedwigia XXIX, 1890, p. 110; Syll. Fung. IX, p. 601.
Phyllachora Julocrotonis Bres., Hedwigia, XXXV, 1896, p. 300; Syll. Fung. XIV, p. 668.

On leaves of *Croton sylvaticum*, Inanda, Natal, January, 1881, Medley Wood (Wood No. 406) [9489].

Stromata visible on both sides of the leaf, ⅓–½ mm. diameter, round, convex on both surfaces, on the upper surface smooth, shiny, often becoming more or less coalescent, and then up to 1 mm. in diameter and more or less irregular in outline. Single stromata unilocular, scattered irregularly over leaf surface. Loculi with an upper and lower epidermal clypeus which is no broader than the loculus. The lateral walls are not so well developed and are light brown. Loculi 200–300 μ diameter, spherical. Asci cylindrical to somewhat club-shaped, paraphysate, briefly pedicellate, 60–70 × 10–14 μ. Spores distichous, one-celled colourless, ellipsoid, rounded at both ends, 14–16 × 7–9 μ.

57. **Phyllachora Cynodontis** (Sacc.) Niessl.

Not. Pyren., p. 54; Syll. Fung. II, p. 602; Ann. Myc. XV (1917), p. 447.

Syn. *Physalospora Cynodontis* Del., Bull. Soc. Myc. Fr., 1890, p. 183; Syll. Fung. IX, p. 599.
Phyllachora graminis var. *Cynodontis*, Sacc. Rabh. F. Eur., 2441.

On *Cynodon dactylon*, Pretoria, 12.7.03, Burtt-Davy [145 and 170]; Groenkloof, Pretoria, 3.5.10, Burtt-Davy [917]; Cedara, Natal, 18.1.11, Fisher [1172]; Vereeniging, 8.6.10, Burtt-Davy [935]; Bloemfontein, 6.4.17, Potts [11311].

On *Cynodon incompletus*, Pretoria, 19.5.06, Pole Evans [17]; 19.6.11 [1587].

Stromata round-angular, scattered, 0·3–0·5 mm. diameter, sometimes coalescing, slightly convex, black. Clypeus epidermal, opaque, only on upper side of the stroma, and usually epiphyllous; on both sides of the leaf, but then the basal clypeus is shorter and not so well developed. Loculi small, spherical, 160–180 μ diameter, usually not penetrating right through the leaf, with a thin delicate wall, scattered or in small groups. Asci paraphysate, cylindrical, club-shaped, pedicellate, 50–60 × 12–15 μ. Spores hyaline, monostichous or distichous, oval-ellipsoid, 10–12 × 5½–6 μ.

58. **Phyllachora Evansii** Syd.

Ann. Myc. X (1912), p. 40; XIII (1915), p. 459.

On *Setaria sulcata*, Barberton, March, 1911, Pole Evans [1280]; Durban, 21.3.19, Bottomley [12231]; Isipingo, Natal, 27.3.18, Bottomley [11659].

On *Setaria nigrirostris*, Vereeniging, Transvaal, 26.2.17, Burtt-Davy [10021].

On *Setaria aurea*, Barberton, 20.1.12, Doidge [2012]; Garstfontein, Pretoria District, 26 3.11, Pienaar [1265].

Stromata visible on both sides of the leaf, scattered or in rows, on yellowish leaf spots, ellipsoid, ½–1 × ⅓–½ mm., dull black; clypeus in both upper and lower epidermis, 20 μ thick, opaque. Loculi few, ellipsoid, 100–150 μ high, 260–230 μ diameter, with thinner, delicate, brown lateral walls. Asci cylindrical, club-shaped, 70–120 × 8–12 μ; paraphysis numerous. Spores mono- or distichous, ellipsoid to oblong, rounded at both ends, straight, colourless, 14–18 × 6–8 μ. Conidia filiform or sickle-shaped, 15·25 × 1 μ.

59. **Phyllachora lucens** (Cke.) Sacc.

Syll. Fung. II, p. 600; Ann. Myc. XV (1917), p. 562.

Syn. *Dothidea lucens* Cke., Grevillea X, p. 128.

On leaves, Inanda, Natal, 1881, Medley Wood (Wood No. 581) [9487 and 10443].

Stromata unilocular, punctiform, only visible on the upper leaf surface, convex, black, shining, thickly crowded on yellow leaf spots, 6–10 mm. in diameter. Loculi flattened spherical, 220–260 μ diameter, 130–160 μ high; the base does not reach as far as the lower epidermis: the locular wall is 8–10 μ thick, consisting of brown cells, but weakly developed, and here and there not very distinct: at the apex it unites with the short black epidermal clypeus. Asci cylindrical, paraphysate, eight-spored, briefly pedicellate, 60–70 × 8–12 μ. Spores distichous or obliquely monostichous, oblong, colourless, one-celled, straight, with blunt ends, 13–15 × 4½–5½ μ.

60. **Phyllachora Penniseti** Syd.

Ann. Myc. XIII (1915), p. 39 (on leaves *Pennisetum Benthami*, Congo).

On leaves of *Pennisetum sphacelatum*, Tugela Valley, near Goodoo, Natal, 16.5.20, Doidge [14102].

Stromata conspicuous on both leaf surfaces, scattered or crowded and arranged in rows, round or oblong, ½–1 mm. long, or forming larger stromata by confluence, black, opaque, plurlocular. Loculi irregular, large, 280–400 μ long, 200–300 μ high. Clypeus in both upper and lower epidermis, 15–25 μ thick, lateral wall of loculus 8–10 μ broad, brown: stylospores straight or flexuous, continuous, filiform, hyaline, 18–35 × 1 μ. Asci clavate, rounded at the apex, 70–95 × 20–26 μ, eight-spored, paraphysate; spores distichous or obliquely monostichous, broadly rounded at both ends, continuous, hyaline, 17–24 × 11–18 μ.

61. **Phyllachora heterospora** P. Henn.

Syll. Fung. XXII, p. 425; Ann. Myc. XV (1917), p. 453.

On leaves of *Panicum maximum*, Bluff, Durban, 7.7.11, Doidge [1611]; Kentani, 1.5.14, Pegler [7773]; Kentani, May, 1915, Pegler (Pegler No. 1953) [9095].

On *Panicum* sp., Barberton, 22.8.12, V. d. Bijl [5137].

Both leaf surfaces are comparatively thickly beset with stromata, which are round or elliptic, ⅓–1 mm. diameter, convex, somewhat shiny, not usually coalescing, and not situated on discoloured leaf areas, the whole leaf becomes yellow. Clypeus epidermal, 20 μ thick, on one or both leaf surfaces. Loculi about 4–10 in each stroma; when the stroma is only on one side of the leaf, occupying about two-thirds of its thickness, closely crowded, 180–230 μ diameter, 160 μ high. When two stromata occur at the same point on opposite sides of the leaf the loculi only reach the centre. Wall brown, about 10 μ thick. Asci cylindrical, paraphysate, 60–80 × 10–16 μ, eight-spored; spores mostly distichous, ellipsoid, tapering somewhat to both ends but rounded, one-celled, hyaline, 13–17 × 7–8 μ.

62. **Phyllachora Tecleae** n. sp.

On leaves of *Teclea natalensis*, 5.6.15, Kentani, Pegler (Pegler No. 2324) [9079].

Stromata in small groups on yellow leaf spots, developing on both sides of the leaf, with a preference for the upper surface, visible on both leaf surfaces, oval, ellipsoid or almost round, 0·5 to 2·5 mm. long, black, somewhat shiny, raised on both surfaces, but not convex, groups of stromata are often oval or elliptic in outline between the lateral veins. The normal thickness of the leaf is about 240 μ, the thickness of the stroma is 300–400 μ. Loculi occupying the whole thickness of the leaf, flattened spherical, 300–400 μ diameter; epidermal clypeus on both leaf surfaces very thick, black, opaque, on the upper surface 40–50 μ thick; basal clypeus thinner, 23–25 μ; lateral wall consisting of thin, delicate, laterally compressed hyphae; leaf tissue between the loculi permeated in every direction by brown hyphal threads. Asci richly paraphysate, cylindrical, eight-spored, with a short foot, 80–90 × 10–13 μ. Spores obliquely monostichous, one-celled, hyaline, ellipsoid or subfusoid, tapering to each end, but rounded not pointed at ends, 13–17 × 5–6 μ.

Phyllachora Tecleae Doidge, nov. sp.

Stromata amphigena plerumque epiphylla, maculis flavidulis insidentia, elliptica v. suborbicularia, 0·5–2·5 mm. diametro atra, parum nitidula. Loculi suborbiculares, 300–400 μ diametro, clypeo epidermale amphigeno, atro, opaco, 40–50 μ crasso. Asci copiose paraphysati, cylindracei, octospori, 80–90 × 10–13 μ. Sporae oblique monostichae, continuae, hyalinae, ellipsoidae v. sub-fusoidae, utrinque attenuatae sed rotundatae, 13–17 × 5–6·5 μ.

Hab. in foliis *Tecleae natalensis*, Kentani, 5.6.15, leg. Pegler [9079].

63. **Phyllachora Tricholaenae** P. Henn.

Engl. Bot. Jahrb. XXIII, p. 541; Syll. Fung. XIV, p. 672; Ann. Myc. XV (1917), p. 461.

On leaves of *Tricholaena rosea*, Winklespruit, Natal, 14.2.13, Pole Evans [5641].

Stromata oval, black, shining, slightly convex, scattered or crowded, ½–1 mm. long, clypeus formed in epidermis of both leaf surfaces, but is more extensive on the side of the apex of the loculus than on the basal side. Loculi delimited at base and apex by the opaque clypeus, lateral walls thinner and more delicate. Loculi spherical, about 240 μ diameter; asci club-shaped, pedicellate, 55–60 × 15–18 μ, paraphysate. Spores distichous, elliptic, abruptly rounded at ends, 12–13 × 7–8 μ.

64. **Telimena Arundinariae** n. sp.

On leaves of *Arundinaria tesselata*, Goodoo Bush, Natal, 20.5.20, Doidge [14103.]

Stromata on yellow leaf spots, scattered or more rarely in groups, minute, oval to ellipsoid, 0·5–0·7 mm. long, dull black, convex on upper leaf surface, penetrating through leaf and becoming visible as minute, dull-black specks on the lower surface. Loculi usually one, sometimes two in each stroma, 120–180 μ diameter, 100–120 μ high, occupying from three-quarters to whole of thickness of leaf, with a dark epidermal clypeus on the upper side, 15–20 μ thick; when the loculus occupies whole thickness of leaf there is also a clypeus developed in the lower epidermis; remainder of locular wall composed of delicate, laterally compressed hyphae. Asci cylindrical, paraphysate, rounded at apex, eight-spored, briefly stipitate, 100–120 × 15–18·5 μ.

Spores obliquely monostichous or distichous, cylindrical, fusiform, tapering somewhat to both ends, four-celled, cells subequal in length, or middle cells somewhat larger than the terminal ones, hyaline or subhyaline, 27–33 × 8–9·5 μ.

Telimena Arundinariae Doidge, nov. sp.

Stromata epiphylla, maculis flavidulis insidentia, sparsa v. gregaria, minuta, elliptica, atra, 0·5–0·7 mm. longa, loculos 1–2 includentia, in hypophylla etiam conspicua. Loculi 120–180 μ diametro, 100–120 μ alti, clypeo epiphyllo v. amphigeno, atro, 15–20 μ crasso. Asci cylindracei, paraphysati, apice rotundati, octospori, breviter pedicellati, 100–120 × 15–18·5 μ. Sporae oblique monostichae v. distichae, cylindraceae v. fusiformae, parum utrinque attenuatae, 3-septatae, hyalinae v. sub-hyalinae, 27–33 × 8–8·5 μ.

Hab. in foliis *Arundinariae tesselatae*, Natal, 20.5.20, leg. Doidge [14103].

65. **Telimena corticicola** n. sp.

On woody stems of *Helichrysum* sp., Alice, C.P., 18.11.17, Doidge [10975].

Stromata scattered irregularly on the greyish bark, minute, dull black, oval to narrow ellipsoid, 0·5 to 0·8 mm. long, somewhat convex, unilocular, or with few loculi sunken in the cortex, not erumpent. Loculi oval to flattened spherical, opening by an apical pore, 300–340 μ diameter, 200–240 μ high, fusing at the apex with the black, opaque, clypeus which is 18–20 μ thick and extends beyond the apex of the loculus a distance of 300–400 μ. The space between the clypeus and the upper part of the loculus is filled with a black opaque hyphal weft similar to that forming the clypeus, and from this a few dark hyphae run out into the substratum. The lower part of the locular wall consists of delicate, almost colourless hyphae, which are strongly compressed laterally. Asci paraphysate, cylindrical, rounded at the apex, very briefly pedicellate, 80–110 × 20–23 μ, rather thick walled. Spores distichous, colourless, cylindrical, rounded at both ends, four-celled, primary cross-wall in the centre, each of two primary cells being later divided in the centre by a secondary wall. Thick walled, wall about 2 μ thick, outer edge smooth, inner curving inward to meet transverse walls and giving the spore the appearance of being constricted, 24–27 × 10–13 μ.

Telimena corticicola Doidge, nov. sp.

Stromata sparsa, corticicola, atra, elliptica, 0·5–0·8 mm. longa, leniter convexa, loculos paucos includentia. Loculi ovati v. suborbiculares, 300–400 μ diametro, 200–240 μ alti, clypeo opaco, 18–20 μ crasso. Asci paraphysati, cylindracei, apice rotundatae, brevissime pedicellati, 80–110 × 20–23 μ. Sporae distichae, hyalinae, cylindraceae, utrinque rotundatae, 3-septatae, 24–27 × 10–13 μ.

Hab. in corticis *Helichrysi* sp., Alice, C.P., 18.11.17, leg. Doidge [10975].

66 **Systremma Pterocarpi** n. sp.

On leaves and twigs of *Pterocarpus ceriseus*, Khami Ruins, Rhodesia, 14.7.20, Bottomley [14101].

Leaf stromata epiphyllous, rarely hypophyllous, scattered, situated on yellowish leaf spots, dull black, round or ellipsoid, 1–1·5 mm. diameter, 450–600 μ high, usually with a concentric zone of secondary stromata with a radius of about 1 mm. from centre of primary stroma. Stromata on twigs and midribs of leaves similar, but usually oval to ellipsoid, somewhat larger and without secondary stromata.

The stromata arise between the epidermis and the palisade cells, the cuticle becomes arched, and a dark-brown epidermal clypeus is formed. The base is also composed of small dark cells, and rests on the palisade cells, but the central part of the stroma is formed of paler, more delicate tissue in which are produced one large and a number of smaller conidial loculi more or less spherical but irregular in size. The conidia are round, oval, pyriform, somewhat angular, brown, and 5–7 μ diameter. The conidial stroma attains a height of 150–250 μ, and does not rupture the cuticle. The ascostroma arises from beneath the conidial stroma, and is similar to it in structure, the latter is pushed up and the cuticle ruptured, its dark base forming the covering layer of the ascostroma. Loculi few, spherical to ellipsoid, or pyriform, 120–200 μ diameter. Asci numerous aparaphysate, eight-spored, thin-walled, evanescent, oblong-cylindrical, about 70 × 10 μ. Spores mono-half distichous, two-celled, brown, cylindrical, with blunt ends, slightly constricted, 10–13·3 × 5–6·3 μ, upper loculus 6–8·6 μ, lower 3·3–5 μ long.

Systremma Pterocarpi Doidge, nov. sp.

Stromata epiphylla, rarius hypophylla, maculis flavidulis insidentia, atra, orbicularia v. elliptica, 1–1·5 mm. diametro, 450–600 μ alta, subepidermalia. Loculi pauci, orbiculares, elliptici v. pyriformi, 120–200 μ diametro. Asci numerosi, aparaphysati, octospori, oblongi v. cylindracei, 70 × 10 μ. Sporae monostichae v. subdistichae, 1-septatae, brunneae, cylindracei, utrinque subtruncatae, leniter constrictae, 10–13·3 × 5–6·3 μ; loculo supero majore 6–8·6 μ longo, infero 3·3–5 μ longo.

Hab. in foliis caulisque *Pterocarpi cerisei*, Khami Ruins, Rhodesia, 14.7.20, leg. Bottomley [14101].

67. **Teratosphaeria fibrillosa** Syd.

Ann. Myc. X (1912), p. 39; XV (1917), p. 631.

On leaves of *Protea grandiflora*, Bains Kloof, near Wellington, 26.2.11, Doidge [1217]; 21.2.12, Doidge [2059]; 5.4.12, Stoneman [2232].

Loculi ellipsoid or pyriform, perithecium-like, 150–220 μ diameter, sunken under the epidermis, arranged in centrifugal, irregularly branched, radiating lines, to a diameter of 1 cm. Locular wall consisting of concentric laters of delicate stromatic hyphae. Apex of loculus penetrating the epidermis but not protruding. No true ostiole. Vegetative stroma meagre, penetrating into the intercellular spaces of the mesophyll below the epidermis in the form of perpendicular hyphal strands. At the apex the hyphae also penetrate the adjacent epidermal cells, but without forming a clypeus. Asci basal, quite sessile, club-shaped, thickened round apex, 70–110 × 25–35 μ, aparaphysate, eight-spored. Spores distichous or tristichous cylindrical, straight, medially slightly constricted at the septum, light-brown, rounded at both ends, 42–52 × 8–9 μ.

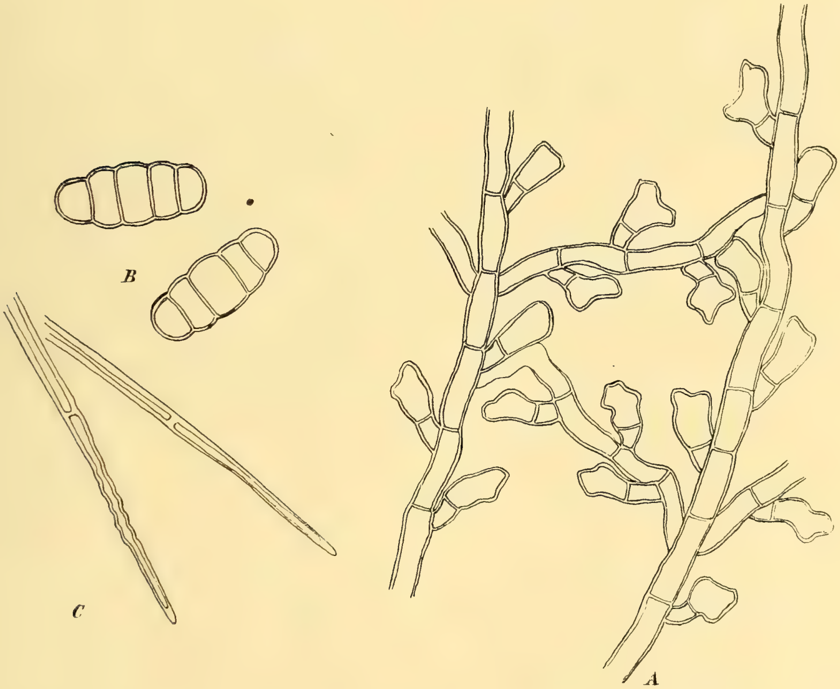

Fig. 1.

68. **Meliola capensis** (K. & Cke.) Th.

Ann. Myc. X (1912), p. 19; Trans. Roy. Soc. S. Afr., V, p. 731.

Syn. *Asterina capensis* K. & Cke., Grevillea 9, p. 32.

This fungus occurs commonly on *Hippobromus alatus*. Its mycelial setae were described as being straight, simple, opaque, 300–400 × 5–10 μ, pellucid near the acute apex. Examination of a large number of collections shows that in the majority at least 50 per cent. of the setae are forked at the apex. The apex of the setae should therefore be described as simple, acuminate, or with two to three acute teeth. [Fig. 2.]

69. **Meliola Carissae** n. sp.

Amphigenous, forming irregular spots 5–6 mm. diameter or larger areas by confluence. Mycelium forming an irregular network, branches opposite, anastomosing. Hyphae slightly undulate, 6–7 μ thick, not infrequently constricted at septa, cells 20–30 μ long; capitate hyphopodia alternate, 20–30 × 10–13 μ, terminal cell variable in form, sometimes club-shaped or sublobed, but most frequently truncate. Mucronate hyphopodia not very numerous, unilateral or alternate, with a short thick neck, 18–20 × 6–7 μ. Mycelial setae fairly numerous, simple, straight, 550–700 μ long, 9–10 μ thick at base, and tapering very gradually to the blunt apex, black and opaque at base, but becoming brown and slightly translucent near apex. Perithecia not very numerous, 180–200 μ diameter, spherical, black, surface cells slightly convex. Asci two-spored, evanescent, spores four-septate, oblong, slightly constricted, rounded at both ends, brown, 43–47 × 16·5–20 μ. [Fig. 1.]

On leaves of *Carissa arduina*, Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12296]; Van Stadens, C.P., 13.11.17, Doidge [10870]; Bathurst, C.P., 14.7.19, Doidge [12341]; Kowie, C.P., 15.7.19, Doidge [12361].

Meliola Carissae Doidge, nov. sp.

Amphigena, maculas irregulares, 5–6 mm. diametro formans; hyphis subundulatis, 6–7 μ crassis, nonnunquam ad septa constrictis, cellulis, 20–30 μ long, ramis oppositis, anastomosantibus; hyphopodiis capitatis alternis, 20–30 × 10–13 μ, cellula superiore variabile, aut clavata v. sublobata aut truncata; hyphopodiis mucronatis paucis, unilateralibus v. alternis, 18–20 × 6–7 μ; setis mycelicis satis numerosis, rectis, simplicibus, 550–700 μ longi, basi opaco, 9–10 μ crassis, apice obtuse sensim attenuatis; peritheciis 180–200 μ diametro, ascis bisporis; sporis 4-septatis, oblongis, leniter constrictis, utrinque rotundatis, brunneis, 43–47 × 16·5–20 μ.

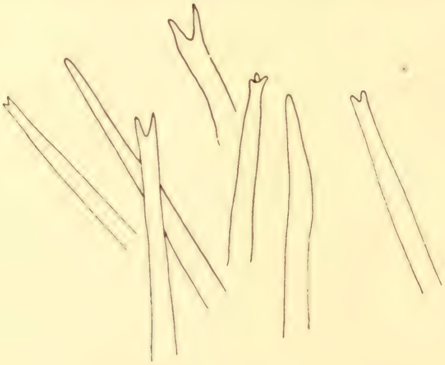

Fig 2.

Hab. in foliis *Carissae arduinae*, Pirie Forest, 8.7.19, leg. Doidge [12296].

70. **Meliola dracoenicola** Pat. et Har.

Bull. Soc. Myc. Fr. XXIV (1908), p. 14, Sacc.; Syll. Fung. XXII, p. 56.

On leaves of *Behnia reticulata*, Louis Trichardt, 8.5.19, Putterill [11848].

This fungus was originally described from the Congo on *Dracoena* sp.; it has not been previously recorded from South Africa.

Amphigenous, black, forming spots 2–5 mm. diameter, easily detachable from the leaf surface. Hyphae brown, straight, 7–9 μ thick; cells 17–20 μ long.; branches opposite, numerous, anastomosing; capitate hyphopodia alternate or unilateral, stipitate, 17–20 × 10–13 μ, stipe cell short, cylindrical, 5–7 μ long, head cell globular; mucronate hyphopodia numerous, alternate or opposite, interspersed with the capitate hyphopodia, pyriform or ampulliform with a straight or curved neck, 15–20 × 6–7 μ. Mycelial setae very numerous, erect, abruptly geniculate at the base or taking a broad curve upwards, opaque, 250–350 μ long, 10–11·5 μ thick, dividing near the apex into two or three short spreading branches, 10–17 μ long, each of these being divided at the apex into two or three small tapering branches, 6–10 μ long, occasionally the latter are themselves bidentate. Perithecia not numerous, black, carbonaceous, globose, 250–300 μ diameter. Spores straight, brown, cylindrical, four-septate, constricted obtuse, 43–46 × 16 μ. [Fig. 3.]

71. **Meliola oleicola** n. sp.

Sub. *M. amphitricha*, Proc. Roy. Soc., South Africa, V, p. 733.

Amphigenous, forming round, dull-black spots, 2–4 mm. diameter, or greater areas by confluence. Mycelium olivaceous, very freely branched and interwoven; branches opposite, anastomosing; capitate hyphopodia alternate, stipitate, 26–30 μ long, terminal cell ovate or club-shaped, straight or somewhat curved, 18–20 × 10 μ, stipe cell short, closely appressed to or forming an acute angle with the branch. Mucronate hyphopodia on separate branches, opposite, alternate or unilateral, slender ampulliform, base not much wider than curved neck, 20–23 × 6–7 μ. Mycelial setae rather numerous, scattered, simple, straight or slightly flexuous, 240–300 μ long, 9–10 μ thick at base, opaque up to acute apex. Perithecia not very numerous, globose, 220–250 μ diameter, verrucose: surface cells convex. Asci two to four spored, early evanescent. Spores oblong, four-septate, very slightly constricted, broadly rounded at both ends, chestnut-brown when mature, 45–50 × 20–23 μ. [Fig. 4.]

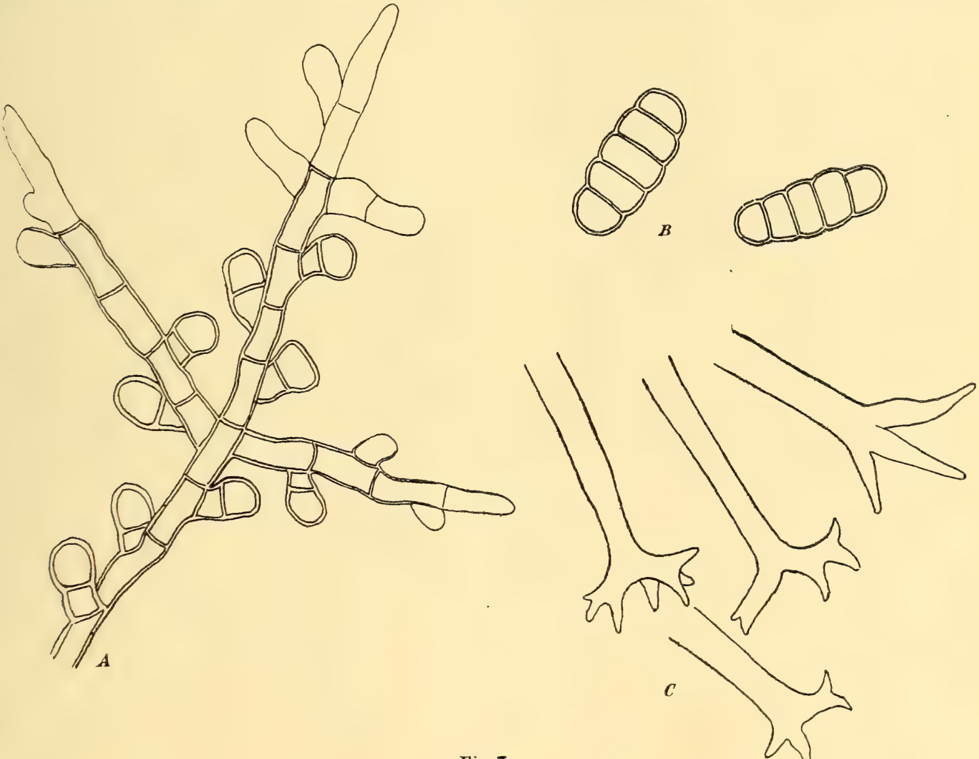

Fig. 3.

On leaves of *Olea laurifolia*, Buccleuch, Natal, 17.7.18, Doidge [11557]; Lemana, Zoutpansberg District, 7.8.11, Doidge [1835]; Tabankulu, Pondoland, 4.4.15 [9103]; Woodville Forest, George, 11.11.17, Doidge [10937].

On *Olea Pegleri*, Kentani, 29.8.14, Pegler (Pegler 1948) [8382–8785].

On *Oleaceae* (?), Woodbush, Zoutpansberg District, 4.8.11, Doidge [1767].

Meliola oleicola Doidge, nov. sp.

Amphigena, maculas atras orbiculares 2–4 mm. diametro formans. Mycelium ramosum, intertextum, ramis oppositis anastomosantibus, hyphopodiis capitatis alternis, stipitatis, 26–30 μ long, cellula superiore ovata v. clavata, recta v. leniter curvata, 18–20 × 10 μ; cellula inferiore breve, hyphopodiis mucronatis oppositis, alternis v. unilateralibus, ampullaceis, 20–23 × 6–7 μ; setis mycelicis satis numerosis, sparsis, opacis, rectis v. leniter flexuosis, simplicibus, 240–300 μ long, basi 9–10 μ crassis, apice acutis. Perithecia globosa, 222–250 μ diametro, verrucosa. Asci 2–4 spori, mox evanescentes. Sporae oblongae 4-septatae, leniter constrictae, utrinque rotundatae, 45–50 × 20–23 μ.

Hab. in foliis *Oleae laurifoliae*, Buccleuch, Natal, 17.7.18, leg. Doidge [11557].

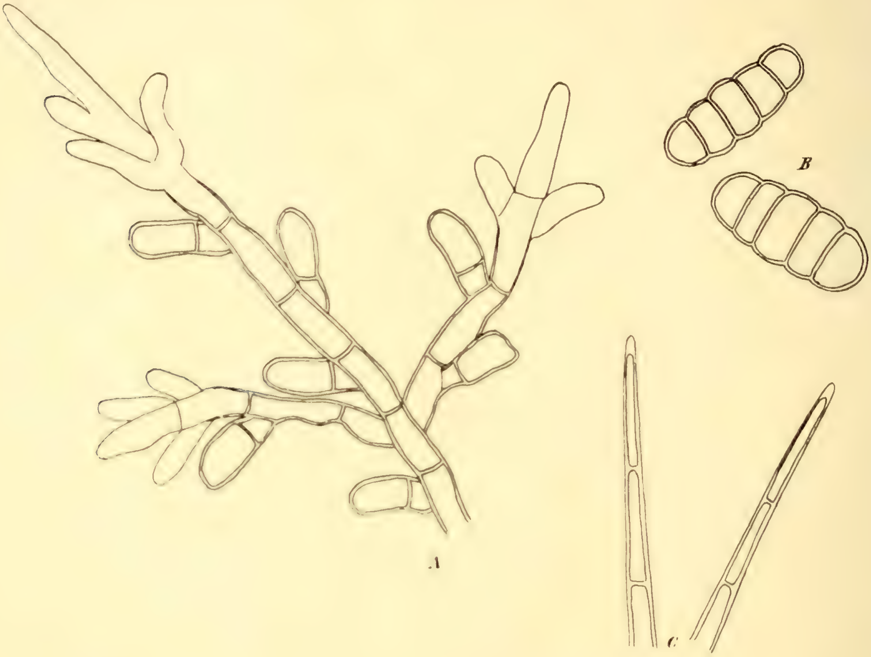

Fig 4

72. **Meliola Panici** Earle.

Muhlenbergia, 1901, p. 12, Sacc.; Syll. Fung. XVII, p. 550.

On leaves of *Stipa dregeana* var. *elongata*, Langholm Estates, Bathurst District, 14.7.19, Doidge [12358].

The type specimen was collected in Porto Rico, and this species has not previously been recorded from South Africa. The original description is as follows:—

Forming minute spots 1–3 mm. diameter, which often become confluent. Hyphae 6–8 μ thick, sparingly branched. Capitate hyphopodia usually alternate and forming a broad angle with the hyphae, 16–20 × 6–8 μ, terminal cell broader than long, irregular, usually three to four lobed. Mucronate hyphopodia numerous, opposite, inserted at right angles, broadly ampulliform, paler, 12 μ long. Mycelial setae numerous, straight, simple, obtuse, obscurely septate, opaque, 400–600 × 8–10 μ, tapering gradually towards the apex. Perithecia scattered, black, three to four spored, evanescent. Spores cylindrical, compressed, four-septate, slightly constricted, rounded at both ends, 40 × 12 × 8 μ.

The South African specimen differs slightly from the above description in that the mycelium is rather dense and copiously branched and anastomosing; the cells of the hyphae are rather short, 13–16 μ long. [Fig. 5.]

73. **Irene Zeyheri** n. sp.

Amphigenous, forming thin black spots 2–4 mm. diameter, or larger areas by confluence; mycelium not dense, forming an irregular network; branches opposite or irregular, anastomosing. Hyphae straight or somewhat sinuous, 6–6·5 μ thick; cells 20–30 μ long; capitate hyphopodia alternate, 18–23 μ long, terminal cell very variable in form, lobed in various ways, 6–14 μ broad at apex; mucronate hyphopodia opposite or unilateral, interspersed with the capitate hyphopodia; ampulliform 16–20 × 6–7 μ. Mycelial setae none. Perithecia scattered, spherical, black, carbonaceous, 190–220 μ diameter, surface cells convex. Asci two-spored, evanescent, spores oblong, brown, four-septate, slightly constricted, rounded at both ends, 39–44 × 16–18 μ.

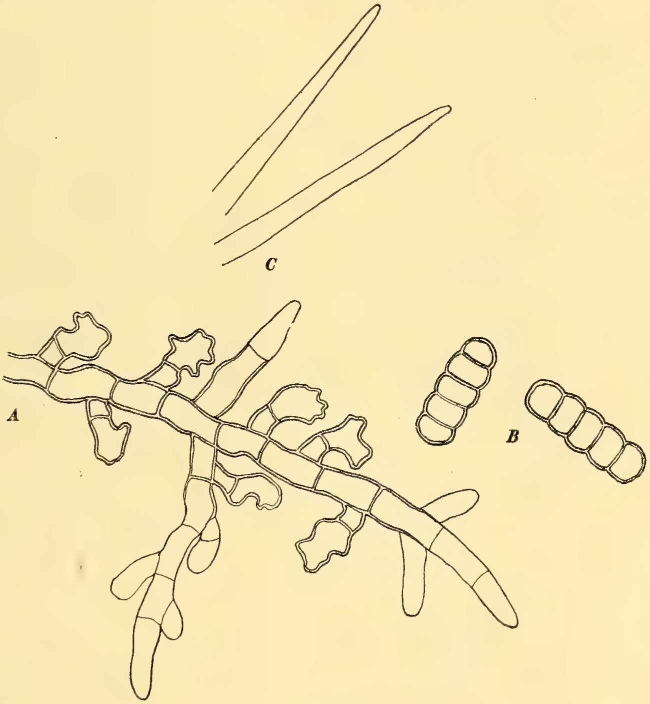

Fig. 5

On leaves of *Eugenia Zeyheri*, Howiesons Poort, 12.7.17, Doidge [12388]; Pirie Forest, 8.7.19, Doidge [12272]; Van Stadens Pass, 13.11.17, Doidge [10878].

Irene Zeyheri Doidge, n. sp.

Amphigena, maculas, tenues, atras formans. Mycelium effusum, hyphis rectis v. leniter sinuosis, 6–6·5 μ crassis, ramis oppositis v. irregularibus, anastomosantibus; hyphopodiis capitatis alternis, 18–23 μ longis, cellula superiore varia, lobata, apice 6–14 μ lata; hyphopodiis mucronatis oppositis v. unilateralibus, ampullaceis 16–20 × 6–7 μ; setis mycelicis nullis. Perithecia sparsa, globosa, atra, 190–220 μ diametro. Asci bispori. Sporae oblongae, brunneae, 4-septatae, leniter constrictae, utrinque rotundatae, 39–44 × 16–18 μ.

74. **Calothyrium Psychotriae** n. sp.

Hypophyllous, forming thin, rusty-brown patches 10–12 mm. diameter Mycelium fuscous, branching and anastomosing irregularly, hyphae about 5 μ thick, without hyphopodia. Thyriothecia in groups, very pale, flattened hemispherical, or irregular in shape on account of lateral pressure of adjacent thyriothecia, 400–430 μ diameter; composed of radiating hyphae 4–5 μ thick, margin entire, but more or less undulate. Asci fairly numerous, paraphysate, eight-spored, spherical or somewhat pyriform, 50–53 μ diameter, or 60–64 × 30 μ. Spores conglobate, hyaline thick-walled, two-celled, slightly constricted, oblong, rounded at both ends, cells subequal, 26–29 × 11·5–13 μ.

On leaves of *Psychotria capensis* (same leaves as *Meliola amphitricha*). 10.7.11, Amanzimtoti, Natal, Doidge [1575].

Calothyrium Psychotriae Doidge, nov. sp.

Hypophyllis, maculas tenues, 10–12 mm. diametro formans. Mycelium fuscum, ramosum, hyphis circ. 5 μ crassis, hyphopodiis nullis. Thyriothecia gregaria rotundata v. mutua pressione angulata v. compressa, 400–430 μ diametro, radiatim ex hyphis 4–5 μ crassis contexta, ad ambitum haud fimbriata. Asci paraphysati, octospori, globosi v. subpyriformi, 50–53 μ diametro vel 60–64 × 30 μ. Sporae conglobatae, hyalinae, 1-septatae, leniter constrictae, oblongae, utrinque rotundatae, 26–29 × 11·5–13 μ.

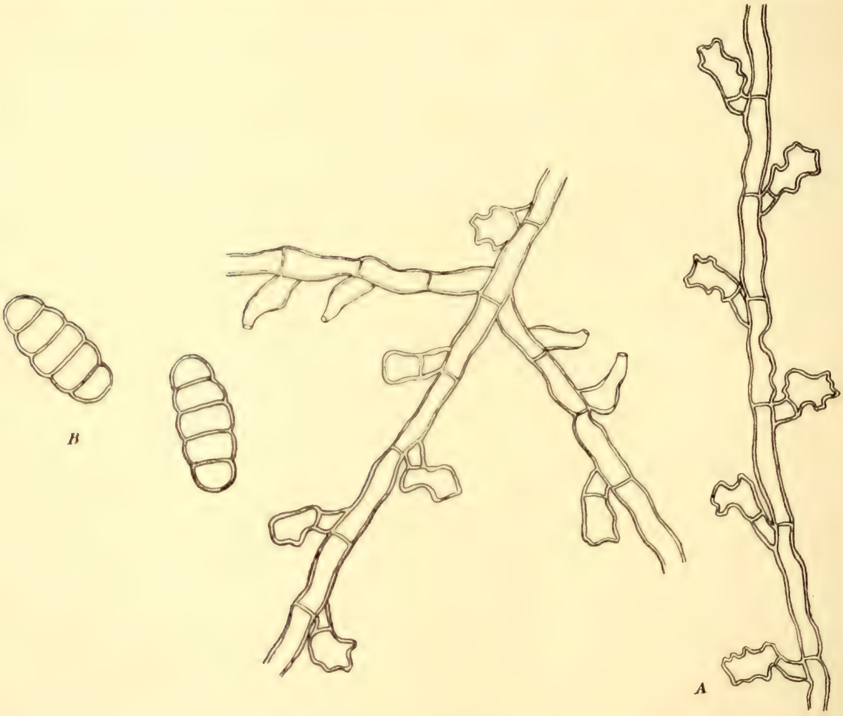

Fig. 6.

Hab. in foliis *Psychotriae capensis*, Amanzimtoti, Natal, 10.7.11, leg. Doidge [1575].

75. **Asterina Crotonicola** n. sp.

On leaves of *Croton rivularis*, East London, 19.7.19, Doidge [12427]; Langholm Estates, Bathurst, 14.7.19, Doidge [12355].

Epiphyllous, forming thin black, carbonaceous spots, 2–3 mm. diameter. Mycelium pale fuscous, not dense, branching and anastomosing irregularly. Hyphae undulating, 3–3·5 μ thick. Cells 18–25 μ long. Hyphopodia unilateral or alternate, minute, continuous, pyriform, 6–7 μ high × 3·5 μ. Thyriothecia rather numerous, scattered, flattened hemispherical, 120–140 μ diameter, formed of radiating hyphae about 3 μ diameter, margin not fimbriate, dehiscing by a stellate fissure, no basal membrance. Asci aparaphysate, eight-spored, subspherical or ovate, sessile, 36–40 × 23–33 μ. Spores conglobate, two-celled, brown, slightly constricted, cells subequal, epispore rough at maturity, 17–20 × 10 μ. Pycnidia similar in form to thyriothecia, but somewhat smaller, about 100 μ diameter; conidia ovate, brown, continuous, without a hyaline band, 17–20 × 12–13 μ.

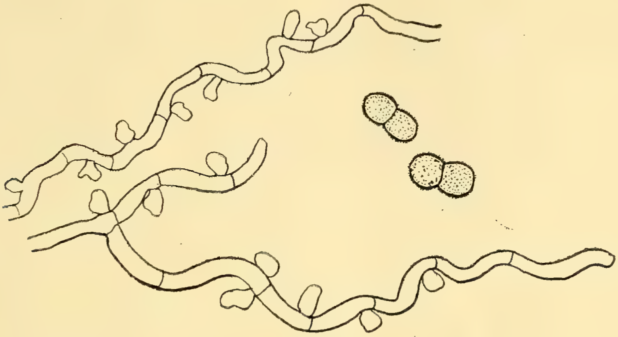

Fig. 7

Asterina crotonicola Doidge, nov. sp.

Epiphylla, maculas tenues atras, 2–3 mm. diametro formans. Mycelium fuscum ramosum, hyphis undulatis 3–3·5 μ crassis, cellulis 18–25 μ longis; hyphopodiis unilateralibus v. alternis, minutis, continuis, pyriformis, 6–7 μ altis, 2·5 μ latis. Thyriothecia satis numerosa, sparsa, orbicularia, 120–140 μ diametro, radiatim ex hyphis circ. 3 μ crassis contexta, stellatim dehiscentia ad ambitum haud fimbriata. Asci aparaphysati, octospori, subglobosi v. ovati, sessiles, 36–40 × 23–33 μ. Sporae conglobatae, 1-septatae, brunneae, in maturitate verrucosae, 17–20 × 10 μ. [Fig. 7.]

Hab. in foliis *Crotonis rivularis*, East London, 19.7.19, leg. Doidge [12427].

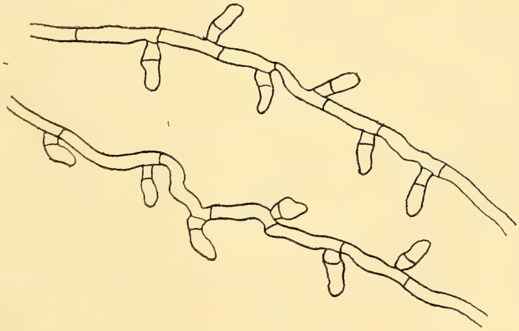

Fig. 8

76. **Asterina Scolopiae** n. sp.

On leaves of *Scolopia Zeyheri*, East London, 19.7.19, Doidge [12414].

On *Scolopia* sp., Mossel Bay, 22.7.15, Pole Evans [9067].

Hypophyllous, forming very thin spots about 5 mm. diameter. Mycelium delicate, diffuse. Hyphae straight or somewhat undulate, branching and anastomosing irregularly, 3–3·3 μ thick; hyphopodia unilateral or alternate, briefly stipitate, often at right angles to hypha, cylindrical, straight or slightly curved, 10–13·3 × 3–3·5 μ. Thyriothecia scattered, flattened-hemispherical, 150–170 μ diameter, composed of radiating hyphae about 3 μ thick; at margin a number of these continue to extend towards and anastomose with vegetative hyphae, dehiscing by a stellate fissure. No basal membrane. Asci subspherical aparaphysate, eight-spored, sessile, 33–40 μ diameter. Spores conglobate, two-celled, slightly constricted, ellipsoid, cells subequal, 20–23·5 × 9–11 μ. Pycnidia similar in form to thyriothecia, but smaller, 80–90 μ diameter. Conidia brown, continuous without a hyaline band, angular kite-shaped, 18–25 × 10–13·5 μ. [Fig. 8.]

Asterina Scolopiae Doidge, nov. sp.

Hypophylla, maculas tenues, circ. 5 mm. latas, formans. Mycelium laxum, hyphis rectis v. subundulatis, 3–3·3 μ crassis; hyphopodiis unilateralibus v. alternis, breviter stipitatis, cylindraceis, rectis v. leniter curvatis, 10–13·3 × 3–3·5 μ. Thyriothecia sparsa, orbicularia, 150–170 μ diametro, radiatim ex hyphis circ. 3 μ crassis contexta, ambitu plus minus fimbriata, stellatim dehiscentia. Asci subglobosi, aparaphysati, octospori, sessiles, 33–40 μ diametro. Sporae conglobatae, 1-septatae, leniter constrictae, ellipsoidae, cellulis subaequalibus, 20–23·5 × 9–11 μ.

Hab. in foliis *Scolopiae Zeyheri*, East London, 19.7.19, leg. Doidge [12414].

77. **Lembosia piriensis** n. sp.

On leaves of *Trichocladus ellipticus*, Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12301].

Epiphyllous, on leaf spots up to 1 cm. diameter, sometimes numerous and confluent, covering greater part of leaf surface. Hyphae slender, fuscous, 3–3·5 μ thick, branching and anastomosing irregularly. Hyphopodia sessile, about 4–5 μ diameter, hemispherical or sublobed, developing at irregular intervals. Thyriothecia scattered, ellipsoid, straight, simple or occasionally forked, 300–400 × 190–240 μ, composed of radiating hyphae about 3 μ thick, margin fimbriate. Asci paraphysate, eight-spored, ovate, somewhat thickened round the apex, sessile, 37–40 × 20–24 μ. Paraphyses hyaline, filiform, about 2 μ thick, equalling or slightly exceeding the asci. Spores two-celled, slightly constricted, ellipsoid, upper loculus broader, 17–20 × 6–7 μ, brown when mature. Pycidia flattened-hemispherical, 100–120 μ diameter. Conidia minute, hyaline, bacilloid.

Lembosia piriensis Doidge, nov. sp.

Epiphylla, maculas usque 1 cm. latas insidentia; hyphis tenuibus, fuscis, 3–3.5 μ crassis, ramosis; hyphopodiis sessilibus, circ. 4–5 μ diametro hemisphaericis, v. sublobatis, dispersis. Thyriothecia sparsa, elliptica, recta, simplices v. nonnunquam bifurcata, 300–400 × 190–240 μ, radiatim ex hyphis 3 μ crassis contexta, ambitu fimbriata. Asci paraphysati, octospori, ovati, sessiles, 37–40 × 20–24 μ. Paraphyses hyalinae circ. 2 μ crassae. Sporae 1-septatae, leniter constrictae, ellipsoidae, 17–20 × 6–7 μ, in maturitate brunneae, loculo superiore latiore.

Hab. in foliis *Trichocladi elliptici*, Pirie Forest, 8.7.19, leg. Doidge [12301].

78. **Trichopeltula Carissae** n. sp.

On leaves of *Carissa arduina*, East London, 24.11.17, Doidge [10914]; 19.7.19 [12424].

Epiphyllous, when thinly sown each thallus is plainly visible, consisting of a number of narrow, dull-black, irregularly branched radiating fibrillae; frequently the thalli are so numerous that they coalesce, and the whole leaf surface becomes encrusted with the dull-black growth; thallus irregular in breadth, 95–275 μ broad, formed of narrow, rectangular, radiating-prosenchymatous cells. Conidial pycnothecia, 90–115 μ diameter, containing bacilliform, hyaline, non-septate conidia, 6–8 μ × 1–1·5 μ. Pycnothecia containing asci somewhat larger, 120–140 μ diameter; asci aparaphysate, eight-spored, obovate or obclavate, broadly rounded at the apex, constricted at the base, with a very short foot, 24–30 × 13–16 μ. Spores tristichous, hyaline, oblong, slightly curved, four to five celled, usually four-septate when mature, 10–14 × 3–4 μ.

Trichopeltula Carissae Doidge n. sp.

Epiphylla, thallus vittaeformis, repens, ramosus; vittae brunneo-atrae, irregulares, 95–275 μ latae, radiato-prosenchymaticae, cellulis anguste rectangularibus. Pycnothecia in thallo formata, alia conidiofera, 90–115 μ, alia ascofera 120–140 μ diametro, applanato hemisphaerica, demum apice perforata. Conidia bacillaria, hyalina, continua, 6–8 × 1–1½ μ. Asci aparaphysati, octospori, obovati v. obclavati, supra late rotundati infra in nodum brevissimum coarctati, 24–30 × 13–16 μ. Sporae tristichae, hyalinae, oblongae, subcurvatae, quadriseptata, 10–14 × 3–4 μ.

Hab. in foliis *Carissae arduinae*, East London, 24.11.17, leg. Doidge [10914].

79. **Trichopeltula kentaniensis** n. sp.

On *Xymalos monospora*, Kentani, 3.3.15, Pegler (Pegler No. 1999) [8866]; Zwartkop, near Maritzburg, Natal, 19.7.18, Doidge [11598].

On *Schmidelia monophylla*, Kentani, 3.3.15, Pegler (Pegler No. 2300) [8865].

This fungus is very similar in appearance to the species on *Carissa*, from which it differs chiefly in the size and form on the asci and spores; the latter are three to four septate, but usually four-septate when mature.

Trichopeltula kentaniensis n. sp.

Epiphylla, thallus vittaeformis, repens, ramosus: vittae brunneo-atrae, irregulares, 64–200 μ latae, radiato-prosenchymaticae, cellulis anguste rectangularibus. Pycnothecia in thallo formata, alia conidiofera 90–110 μ, alia ascofera 160–180 μ diametro, applanato-hemisphaerica, demum apice perforata. Conidia bacillaria, hyalina, continua, 4–6 × 1–1·5 μ. Asci aparaphysati, octospori, ellipsoidei v. subclavati, apedicellati, 30–36 × 13–16 μ. Sporae tristichae, hyalinae, subclavatae, rectae, quadriseptatae, 15–17 × 3·5–5 μ.

Hab. in foliis *Xymalos monosporae*, Kentani, 3.3.15, leg. Pegler [8866].

Fungi belonging to this group appear to be very common in many localities, particularly in the neighbourhood of East London; but, although material has been collected at different seasons of the year, only the two species described above have been found with mature asci. Immature fungi belonging to the *Trichopeltaceae* have been collected near East London and elsewhere on the following hosts: *Acokanthera spectabilis*, *Behnia recticulata*, *Buxus MacOwani*, *Chaetacme aristata*, *Elaeodendron capense*, *Elaeodendron croceum*, *Eugenia* sp. *Putterlichia pyracantha*, *Rhoicissus rhomboidea*, *Toddalia natalensis*, *Trichocladus ellipticus*, *Umtisa Listeriana*.

80. **Scolecopeltis Cassipoureae** n. sp.

Ascomata hypophyllous, not situated on leaf spots, scattered, superficial, easily becoming detached, opaque, dark-green in the centre, translucent, paler at edges, 550–650 μ diameter, composed of a dense weft of fine hyphae 1–2 μ thick.

Ostiole distinct, round 23–36 μ diameter. Asci aparaphysate, ellipsoid, sessile, 120–170 × 20–26 μ, four to eight spored. Spores parallel or twisted, filiform, 100–120 μ long, six to seven broad at centre, tapering somewhat towards rounded ends, ten to fifteen septate, constricted, easily separating even in ascus into very uneven portions 6–15 μ long.

On leaves of *Cassipourea verticillata*, Buccleuch, Natal, 17.7.18, Doidge [11586].

Scolecopeltis Cassipoureae Doidge, nov. sp.

Peritheciis hypophyllis, sine maculis, sparsis, superficialibus, facile secedentibus, opace atro-coeruleis, lenticulari-scutatis margine alatis, 550–650 μ diametro marginem versus coerulee pellucidis, ibique ex hyphis 1–2 μ latis tenuibus, maeandrice denseque conjunctis contextis, praeterea margine ca. 30–60 μ latofere hyalino ex hyphis 1–2 μ latis anastomosantibus composito cinctis, ostiolo distincto, rotundato, 33–36 μ lato: ascis aparaphysatis, ellipsoideis, sessilibus, 120–170 × 20–26 μ, 2–8 sporis, sporidiis parallelis v. tortis, filiformis 100–120 μ × 6–7 μ, utrinque leniter attenuatis, 10–15 septatis, constrictis, facile secedeutibus.

Hab. in foliis *Cassipoureae verticillatae*, Buccleuch, Natal, 17.7.18, leg. Doidge [11586].

81. **Asterinella Mimusopsidis** n. sp.

On leaves of *Mimusops obovata*, Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12267]; East London, 19.7.19, Doidge [12409].

Hypophyllous, forming thin black spots up to 5 mm. diameter; mycelium reticulate, alternate or opposite, branching, composed of fuscous-brown hyphae, more or less torulose, and undulate, varying in thickness from 3–6 μ, articulation more or less irregular; hyphopodia none; thyriothecia crowded in centre, or scattered, flattened-hemispherical, 240–320 μ diameter, dehiscing by collapse of central cells or by radial fissure, composed of straight radiating hyphae 3–3·5 μ thick, margin entire or with numerous rather delicate hyphae about 3 μ thick running out into the mycelium. Asci aparaphysate, ovate or narrow ovate, sessile, eight-spored, thickened round apex, 60–70 × 25–35 μ. Spores conglobate, two-celled, brown, constricted at septum, 28–33 × 13–16·5 μ, slightly rough at maturity, upper loculus broader, broadly rounded at both ends.

Asterinella Mimusopsidis Doidge, nov. sp.

Hypophylla, maculas tenues usque 5 mm. latas formans, mycelium ex hyphis fuscidulis, subtorulosis, undulatis 3–6 μ crassis formatum. Hyphopodia desunt. Thyriothecia conferta v. sparsa, orbicularia, 240–320 μ diametro, radiatim ex hyphis rectis 3–3.5 μ crassis contexta, peripherice hyphis longiusculis, flexuosis, 3 μ crassis fimbriata. Asci aparaphysati, ovati, sessiles, octospori, ad apicem incrassati, 60–70 × 25–35 μ. Sporae conglobatae, 1-septatae, brunneae, constrictae, 28–33 × 13–16·5 μ, in maturitate minute verrucosae, loculo superiore latiore.

Hab. in foliis *Mimusopsidis obovatae*, Pirie Forest, 8.9.19, leg. Doidge [12267].

82. **Meliola gemellipoda** n. sp.

On leaves of *Jasminum angulare*, Langholm Estates, Bathurst District, 14.7.19, Doidge [12352].

Epiphyllous, forming round black velvety spots 1–5 mm. diameter. Mycelium compact, fairly dense, formed of straight or slightly wavy hyphae 10 μ thick; cells 20–30 μ long; branching opposite or irregular; capitate hyphopodia opposite, usually one pair to each cell of hypha, 16–23 × 9–10 μ, stipe cell short, 3–5 μ, terminal cell ovate to cylindrical, rounded at the apex. Murconate hyphopodia rare, interspersed with capitate hyphopodia, ampulliform 20–30 μ long × 10 μ thick at base. Mycelial setae fairly numerous, simple, straight, black, opaque except near the somewhat blunt apex, 9–10 μ thick at base, tapering gradually towards apex, 360–600 μ long. Perithecia 200–250 μ diameter, black, globose, smooth. Asci two to three spored, evanescent. Spores four-septate, cylindrical or tapering slightly towards both ends, rounded at both ends, scarcely constricted, 53–60 × 16·5–20 μ. Closely related to *M. Toddaliae*.

Meliola gemmellipoda Doidge, nov. sp.

Epiphylla, maculas atras, orbiculares, 1–5 mm. diametro efformans; mycelio ex hyphis ramosis, septatis, 10 μ crassis composito; hyphopodiis capitatis oppositis 16–23 × 9–10 μ, cellula superiore ovata v. cylindrica; hyphopodiis mucronatis raris, ampulliformibus usque ad 30 μ longis; setis mycelicis numerosis, simplicibus, rectis, opacis, 360–600 μ longis, obtusis; peritheciis 200–250 μ diametro, atris, laevis, globosis; ascis, 2–3 sporis, evanescentibus; sporidiis 4-septatis, ad septa vix constrictis, 53–60 × 16.5–20 μ.

Hab. in foliis *Jasminii angularis*, Bathurst District, Cape Province, 14.7.19, leg. Doidge [12352].

83. **Irene Rinoreae** n. sp.

On leaves of *Rinorea ardesiaeflora*, Karkloof, Natal, 14.7.21, Doidge [14961].

Amphigenous, forming small, round, dull-black spots 1–2 mm. diameter: these are occasionally rather numerous and become confluent, but usually they are scattered and only one to two spots occur on a leaf.

Mycelium reticulate: hyphae dark-brown, semi-opaque, 6–7 μ thick, cells mostly 18–20 μ long, branches opposite, anastomosing, capitate hyphopodia alternate, usually one to each cell, stipitate, 17–26 μ high, terminal cell variously lobed with rounded or truncate lobes 17–20 μ broad. Mucronate hyphopodia rather numerous, interspersed with the capitate hyphopodia, opposite, alternate or unilateral: they are rather peculiar in form, reminding one of penguins at rest, 17–20 μ long and 5–6 μ thick at the base; mycelial setae none.

Perithecia spherical, black, carbonaceous, 140–200 μ diameter, surface cells conical or rounded, projecting to a height of 16–18 μ. (These could hardly be termed appendages; and the species is accordingly assigned to the genus *Irene.*) Asci fugaceous, not seen. Spores four-septate, cylindrical, rounded at both ends, constricted, 40–46 × 16·5–21·5 μ.

Irene Rinoreae Doidge, nov. sp.

Amphigena, plagulas minutas, atras, 1–2 mm. diametro efformans. Mycelio reticulato. Hyphis brunneis, subopacis, 6–7 μ crassis, cellulis plerumque 18–20 μ longis, hyphopodiis capitatis alternis, stipitatis 17–26 μ altis, cellula superiore varie lobata, lobis rotundatis v. truncatis. Hyphopodiis mucronatis numerosis, oppositis, alternis v. unilateralibus, 17–20 μ longis, basi 5–6 μ crassis.

Setis mycelicis nullis. Peritheciis globosis atris, tuberculatis, 140–200 μ diametro. Ascis non visis. Sporidiis 4-septatis, cylindricis, utrinque rotundatis, ad septa constrictis, 40–46 × 16·5–21·5 μ.

Hab. in foliis *Rinoreae ardesiaeflorae*, Karkloof, Natal, 14.7.21, leg. Doidge [14961].

84. **Phyllachora myrsinicola** n. sp.

On leaves of *Myrsine melanophleos*, Duncairn, near Maritzburg, 13.7.21, Doidge [15015].

Stromata epiphyllous, not visible on lower surface of leaf, and not surrounded by discoloured leaf tissue, scattered, ½–1 mm. diameter, black, somewhat shiny, flat, very slightly raised above the epidermis.

Several loculi in each stroma, occupying about half the thickness of the leaf, which is here swollen to about twice its normal thickness. Loculi covered by a common epidermal clypeus which is black, opaque, and variable in thickness. Loculi not closely crowded, subspherical, 180-240 μ diameter, lateral and basal walls well developed, consisting of laterally compressed hyphae, usually hyaline, but sometimes brown at the base and where the lateral walls join the clypeus. Asci clavate 80–100 × 20–27 μ, thick-walled, rounded at the apex, eight-spored, paraphysate, briefly pedicellate. Spores distichous, one-celled, hyaline, ellipsoid or rhomboid-ellipsoid, 16·5–23·5 × 9–10 μ.

Phyllachora myrsinicola Doidge, nov. sp.

Stromata epiphylla, atra, in inferiore foliorum pagina non visibilia, sparsa, ½–1 mm. diametro parum nitidula, loculi pauci in quoque stromate, suborbiculares, 180–240 μ diametro, clypeo epidermale atro, opaco. Asci paraphysati, clavati, octospori, breviter pedicellati, 80–100 × 20–27 μ. Sporae distichae, continuae, hyalinae, ellipsoidae v. subrhomboidae, 17·5–23·5 × 9–10 μ.

Hab. in foliis *Myrsine melanophleos*, Duncairn, near Maritzburg, Natal, 13.7.21, leg. Doidge [15015].

85. **Clypeosphaeria natalensis** n. sp.

On leaves of *Viscum nervosum* growing on *Rapanea melanophleos*, Glen Burnie, Highflats, Ixopo District, Natal, 20.8.21, J. W. Bews [14867].

Perithecia and pycnidia epiphyllous, in scattered groups, similar in form and size, immersed, lenticular, spherical, convex at the apex with a black, opaque epidermal clypeus; 160–200 μ in diameter, very slightly papillate in the centre, where it becomes perforated by a pore; wall black, carbonaceous, 16–20 μ thick.

Asci paraphysate, subpyriform, broadly rounded at the base, narrower at the apex, thick-walled around the apex, which is traversed by a pore, eight-spored, evanescent, 90–120 × 20–27 μ. Spores fuscous, four to five septate, cylindrical or subclavate, parallel or obliquely distichous, 42–54 × 7·5–10 μ.

Conidia hyaline, cylindrical or clavate, rounded at both ends, transversely six to eight septate, 50–62 × 10–11 μ.

Clypeosphaeria natalensis Doidge, nov. sp.

Peritheciis et pycnidiis epiphyllis, gregariis, immersis, lenticulariter sphaeroideis, vertice applanato, convexulo, centro leniter papillulatis demum poro perforatis, atris, 160–200 μ diametro; ascis octosporis, paraphysatis, subpyriformibus, basi late rotundatis, sessilibus, apice incrassatis poro pertusis, evanescentibus, 90–120 × 20–27 μ. Sporidiis fuscis oblique; distichis v. parallelibus, 4–5 septatis, cylindricis, v. subclavatis, 42–54 × 7·5–10 μ.

Conidiis hyalinis, cylindricis v. clavatis, utrinque rotundatis, 6–8 septatis, 50–62 × 10–11 μ.

Hab. in foliis *Visci nervosi*, Ixopo District, Natal, 20.8.21, leg. Bews [14867].

EXPLANATION OF ILLUSTRATIONS.

Fig. 1. *Meliola Carissae.* (*a*) Mycelium with capitate hyphopodia. (*b*) Spores. (*c*) Mycelial setae.
Fig. 2. *Meliola capensis.* Tips of mycelial setae.
Fig. 3. *Meliola dracoenicola.* (*a*) Mycelium. (*b*) Spores. (*c*) Tips of mycelial setae.
Fig. 4. *Meliola Oleicola.* (*a*) Mycelium. (*b*) Spores. (*c*) Tips of setae.
Fig. 5. *Meliola Panici.* (*a*) Mycelium. (*b*) Spores. (*c*) Tips of setae.
Fig. 6. *Irene Zeyheri.* (*a*) Mycelium. (*b*) Spores.
Fig. 7. Mycelium and spores of *Asterina crotonicola.*
Fig. 8. Mycelium of *Asterina Scolopiae.*

THE THORN PEARS

(*Scolopia spp.*).

By E. P. PHILLIPS, M.A., D.Sc., F.L.S., Division of Botany, Pretoria.

THE genus *Scolopia* was founded by Schreber in 1789, and the following year Loudon established the genus *Phoberos* for the same group of plants. It is under the latter name that the species are described in the "Flora Capensis." The genus is included by Bentham and Hooker under the natural order *Bixineae*, but Engler only includes the genus *Bixa* in this family and places *Scolopia* in the family *Flacourtiacecae.* Gilg in Engler's "Botanische Jahrbüch," vol. 40, p. 481, gives a list of the African species, and describes a new species from the Transvaal, viz. *Scolopia Engleri.* Sim ("Forests and Forest Flora," p. 126) recognized three South African species only, viz. *S. Mundii, S. Zeyheri,* and *S. Flanaganii,* and regards *S. Ecklonii* and *E. Gerrardii* as co-specific with *S. Zeyheri.* My examination of herbarium material has led me to recognize *S. Zeyheri* and *S. Ecklonii* as specifically distinct, and to regard *S. Gerrardii* and *S. Engleri* as varieties of *S. Ecklonii.* A very distinct species of the genus, collected at Barberton by Mr. G. Thorncroft, is described here.

The presence or absence of thorns is evidently not a constant character as Sim notes, as specimens sent in by Mr. A. O'Connor from the Woodbush Forest, Transvaal, are stated to be sometimes thorny and sometimes thornless. Though this may be the case, yet my examination of the genus does not confirm Sim's suggestion that *S. Zeyheri* and *S. Ecklonii* are the same species. Both the character of the leaves and the presence or absence of hairs on the inflorescence can be used to distinguish them. In herbarium material thorns were present on some specimens of *S. Zeyheri,* and it is only from information supplied by Mr. O'Connor that we can be certain of the presence of thorns in *S. Ecklonii,* as this character was not observed in any of the herbarium specimens. Mr. O. B. Miller, commenting on specimens collected by him in the Amanzamnyama and Buffalo Neck Forests, Mount Frere District, writes: "Yesterday I found a very large old 'red pear' with several sucker shoots growing from the stem at a height of 3 ft. 6 in. from ground-level. So far as I could see the rest of the tree was quite unarmed. It is the first time I have ever observed a thorned tree of this species, except in the seedling stage, when it is always armed. I have since seen another 'red pear' with armed suckers, and the native guard says they are fairly common in this district."

I have not seen authentic specimens of *S. Engleri,* but have examined Transvaal plants which agree with Gilg's description of this species. In some respects it appears to be an intermediate form between *S. Zeyheri* and *S. Ecklonii,* having the pubescent inflorescence of the former and the leaves of the latter, but the specimens are so similar to *S. Ecklonii* and the distribution limited to the bushveld that I prefer keeping it as a variety of this species. I have also decided to place *S. Gerrardii* as a variety of *S. Ecklonii,* as though while the specimens hitherto placed under the former species have a distinctive appearance owing to the size of the leaves, yet the examination of a large series of specimens of *S. Ecklonii* indicated that this species merges into *S. Gerrardii.*

I have to thank the Chief Conservator of Forests, Dr. Schönland, the Directors of the Transvaal and South African Museums, for the loan of the material in their respective herbaria.

KEY TO SPECIES.

- Inflorescence a dense cylindric spike about 1 cm. in diameter.................... *Thorncroftii.*
- Inflorescence a lax raceme.
  - Leaves small, usually about 2 cm. long and 1 cm. broad; fruit minutely pubescent *Flanaganii.*
  - Leaves usually over 2 cm. long and 1 cm. broad; fruit glabrous.
    - Inflorescence pubescent.
      - Leaves usually ovate in outline.................................. *Zeyheri.*
      - Leaves usually obovate or oblanceolate in outline (Transvaal species) *Ecklonii,* var. *Engleri.*
    - Inflorescence glabrous.
      - Leaves usually abruptly acuminate and distinctly serrated.......... *Mundii.*
      - Leaves not abruptly acuminated, entire or sometimes remotely serrated.. *Ecklonii.*

S. Thorncroftii, Phillips.

Arbor 6–7 mm. altus. *Rami* glabri. *Folia* 5·5–9·5 cm. longa, lanceolata vel obovata, aliquando subacuminata, apice obtusa, glabra. *Inflorescentia* densa, cyclindrica, circa 1 cm. lata, pubescentia. *Petala* 1·25 mm. longa, linearia, apice acuta. *Filamenta* 6 mm. longa. *Ovarium* 1·5 mm. latum, globosum; stylus 2 mm. longus, apice paullo bifidus.

TRANSVAAL.—Barberton Div.: Barberton, 2900 ft., flowers white, *Thorncroft* 811, and *in Natal Herbarium* 14245.

Tree 20 ft. high. *Branches* glabrous, with the epidermis peeling off in membranous flakes. *Leaves* petioled; petioles 1–1·5 cm. long; lamina 4·5–8 cm. long, lanceolate or obovate, sometimes subacuminate, obtuse, entire, sometimes with wavy margins and with the veining distinct above and beneath, glabrous. *Inflorescence* in dense cylindric axillary spikes about 1 cm. in diameter. *Axis* pubescent. *Flowers* subsessile. *Sepals* 1·5 mm. long, ovate, obtuse, ciliate, pubescent. *Petals* 1·25 mm. long, linear, acute. *Glands* 0·5 mm. long, arranged in a continuous row on the receptacle. *Stamens* numerous; filaments 6 mm. long, surrounded at the base with long hairs; anthers ovate in outline, somewhat apiculate. *Ovary* 1·5 mm. in diameter, globose; style 2 mm. long, subterete, faintly bilobed at the apex.

This is a very distinct species and easily recognized by the dense cylindric inflorescence.

S. Flanaganii (Sim, "Forest and Forest Flora," p. 127, Pl. III.)

A small tree. *Branches* glabrous with raised lenticels. *Leaves* subsessile, 1·1–3 cm. long, 0·5–1·5 cm. broad, elliptic, rarely obovate, obtuse, sparsely serrated on the upper half, with distinct veining, glabrous. *Flowers* not seen. *Fruit* 0·5 mm. in diameter, subglobose, finely pubescent.—*Xylosma Flanaganii*, *Bolus*, *in* "*Journ. Bot.*," *Jan.*, 1896.

CAPE PROVINCE.—Kingwilliamstown Div.: Kingwilliamstown, *Sim* 2571, and *in Natal Govt. Herb.* 8616.

This species is easily distinguished from the rest of the genus by the sessile leaves and the pubescent fruits.

S. Zeyheri [Szyszy in Pl. Rehmann (1887), 19].

A thorny shrub 8–10 ft. high (ex *Galpin*). *Youngest branches* minutely pubescent or glabrous, sometimes armed with spines 1·5–17 cm. long. *Leaves* petioled; petioles 0·5–1·5 cm. long; lamina 1·3–7 cm. long (usually 2·5–4 cm. long), 1–5 cm. broad (usually 2–3 cm. broad), ovate, ovate-elliptic, elliptic, elliptic-lanceolate, or obovate, more rarely subrotund or obcordate, obtuse or rounded at the apex, more rarely subacuminate or retuse, rounded or cuneate at the base, with entire margins, more rarely subcrenate, with the veining distinct beneath, glabrous. *Inflorescence* an axillary raceme, 2·8–6·5 cm. long, usually lax, but sometimes more or less dense, though never broadly cylindric. *Axis* of inflorescence and pedicels finely but densely pubescent. *Sepals* 0·75–2 mm. long, 0·75–1·5 mm. broad, ovate, oblong, elliptic or suborbicular, obtuse or acute sometimes subacuminate, usually shortly ciliate, pubescent without. *Petals* when present 1 mm. long, 0·75 mm. broad, ovate. *Glands* 0·25–0·5 mm. long, arranged in a continuous row on the receptacle. *Stamens* numerous; filaments 1·5–3 mm. long, surrounded at the base by long hairs; anthers 0·5–1 mm. long, ovate, or suborbicular in outline. *Ovary* 0·5–1·25 mm. in diameter, globose or ellipsoid, glabrous; style 1·5–2 mm. long, subterete, faintly bilobed at the apex (sometimes each lobe again faintly lobed). *Fruit* (mature ?) 5 mm. in diameter, globose, glabrous, tipped with the persistent style.—*Sim, "Forest and Forest Flora," p.* 126, *pl. ii; Gilg in Engl. "Bot. Jahrb.,"* 40, *p.* 481; *Phoberos Zeyheri, Arn., "Flora Capensis," I*, 68.

Cape Province.—Bathurst Div.: Port Alfred, *Schlechter* 2733. Stutterheim Div. Katberg, *MacOwan in Natal Govt. Herb.* 1113. Komgha Div.: In woods near Komgha, 2000 ft., *Flanagan*, 863. East London Div.: East London, *Wood in Herb. Galpin* 2828. Somerset East Div.: Zuurberg, *Holland* 279; banks of Klein Visch River, near Somerset East, *MacOwan* 808; woods on slopes of Boschberg, 3000 ft., *MacOwan* 1324. Queenstown Div.: Ridges at Finchams Nek, 4000 ft., *Galpin* 1822.

East Griqualand.—Maclear Div.: In wooded kloofs, Pot River Berg, 5500 ft., *Galpin* 6830.

Natal.—Near Sinkwasi River, 500 ft., wood, Lundies Hill, *Wood* 10170, and *in Natal Govt. Herb.* 10780.

S. Mundii (Warb. in Engl. and Prantl. Pflanzenfam. iii, 6a, 29).

Branches glabrous. *Leaves* petioled; petioles 0·5–1 cm. long; lamina 1·5–7·5 cm. long, 0·7–4 cm. broad (usually 4–5 cm. long and about 2 cm. broad), abruptly acuminate, rarely not acuminate, acute or subacute, more rarely rounded or obtuse, cuneate at the base, with sharply serrated margins, veining distinct beneath, glabrous. *Inflorescence* a lax axillary raceme, 2–3 cm. long. *Axis* of inflorescence and pedicels quite glabrous. *Sepals* 1·5–2·5 mm. long, 1·5–2·5 mm. broad, ovate or subrotund, sometimes subacuminate, acute, obtuse or sometimes rounded at the apex, glabrous. *Glands* 0·5–1 mm. long, usually quadrate in outline, somewhat fleshy and arranged in a continuous row on the receptacle. *Stamens* numerous; filaments 3·5–5 mm. long, surrounded at the base with long hairs; anthers 0·75–1 mm. long, oblong, elliptic or orbicular in outline, usually apiculate at the apex. *Ovary* 1–3 mm. in diameter, globose or ellipsoid, glabrous; style 2·5–3 mm. long, subterete, divided at the apex into two short lobes, sometimes each lobe again faintly lobed. *Fruit* about 1 cm. in diameter, globose, glabrous.—*Sim, "Forests and Forest Flora," p.* 126, *pl. i; Gilg in Engl. "Bot. Jahrb.,"* 40, *p.* 481; *Phoberos Mundtii, Arn., "Flora Capensis," I*, 68.

Cape Province.—Cape Div.: Kirstenbosch, in wood, Table Mountain, *Zeyher*. Knysna Div.: Grootkops River, Concordia, *Keet in Herb. Forest Dept.* 2373. Port Elizabeth Div.: Van Staadens, *Zeyher* 3785. Albany Div.: Woods about Grahamstown, 2000 ft., *MacOwan* 957, and *in Natal Govt. Herb.* 226. Komgha Div.: In woods at Prospect Farm Komgha, 2100 ft., *Flanagan* 62. Queenstown Div.: Lesseyton Nek, near Queenstown, 4000 ft., *Galpin* 2146; mountain top, Gwatyn Farm, 5400 ft., *Galpin* 8295.

Transkei.—Tembuland, towards reservoir, near Cala, *Royffe* 204; Pondoland, Engcobo Div.: Manina Forest, *Zahn in Herb. Forest Dept.* 2040; Amamzaminyama Forest, Mount Frere Dist., *Miller in Herb. Forest Dept.*, 3208, 3223.

Natal.—Polela Div.: Polela, Drakensbergen, 6000–7000 ft., *Evans* 624, and *in Natal Govt. Herb.* 7407.

Zululand.—Qudeni Forest, 6000 ft., *Davis* 122, and *in Natal Govt. Herb.* 8807.

Transvaal.—Ermelo Div.: Nooitgedacht, *Pott* 5097, and *in Herb. Transvaal Mus.* 14932.

Basutoland.—Thaba-Bosin Div. : Banks of Mohale River, *Jacottet in Herb. Dieterlen* 1062. Maseru Div. : Matukeng, slopes of Qcme Mountain, *Dieterlen* 852.

A tree 15–20 ft. high (*Evans*). A tree 10 ft. high ; drupe yellow (*Galpin*) ; Sesuto name " Moopa-Koma."

S. Ecklonii [Szyszy, Pl. Rehmann (1887)].

Branches glabrous with raised lenticels *Leaves* petioled ; petioles 0·5–1 cm. long ; lamina 2·5–11 cm. long, 0·7–3·6 cm. broad, mostly elliptic-lanceolate, more rarely lanceolate, oblanceolate or obovate, rounded or obtuse at the apex, more rarely subacute, cuneate at the base, with entire margins, rarely with a few teeth, with distinct veining, glabrous. *Inflorescence* a lax axillary raceme. *Axis* and pedicels quite glabrous. *Sepals* 1–2 mm. long, 0·75–1 mm. broad, ovate or oblong, obtuse, acute, or subacute, labrous. *Petals* when present 1–1·5 mm. long, linear or oblong. *Glands* forming a rim on the receptacle. *Stamens* numerous ; filaments 2–5 mm. long, surrounded at the base with long hairs ; anthers oblong or ovate in outline. *Ovary* 1·5 mm. in diameter, subglobose ; style 1·5–3 mm. long, faintly or distinctly 2–4-lobed at the apex. *Fruit* 4·5 mm. in diameter, globose.—*Sim*, " *Forests and Forest Flora*." *p*. 127 ; *Gilg in Engl*. " *Bot. Jahrb*.," 40, *p*. 481 ; *Phoberos Ecklonii*, *Arn*., " *Flora Capensis*," *I*, 68.

Cape Province.—Uitenhage Div. : Van Staadens Mountains, *Zeyher* 782. Albany Div. : In woods near Grahamstown, *MacOwan* 1324.

Natal.—Near Tugela River, 500 ft., *Wood* 3951, and *in Natal Govt. Herb*. 4578.

Zululand.—Qudeni Forest, 6000 ft., *Davis* 99, and *in Natal Govt. Herb*. 8806 ; swamp, Umhlatuzi Forest, *Ballenden in Herb. Forest Dept*. 2559.

Transvaal.—Pietersburg Div. : Potatobosch, Woodbush Forest, 4900 ft., *Botha in Herb. Forest Dept*. 2132 ; *O'Connor in Herb. Forest Dept*. 2009.

Var. **Gerrardii,** Phillips.

Leaves up to 8 cm. long and 5 cm. broad, with usually undulate margins and sometimes remotely serrated.—*Scolopia Gerrardii*, *Harv*., " *Flora Capensis*." *II*, 548.

Natal.—Westville, near Durban, 4000–5000 ft., *Wood* 8597, and *in Natal Govt. Herb*. 9320 ; Sydenham, 300–400 ft., *Wood* 11402.

Pondoland.—Engcobo Div. : Manina Forest, *Zahn in Herb. Forest Dept*. 2041.

Var. **Engleri,** Phillips.

Agrees with the type, but the inflorescence is slightly pubescent.—*S. Engleri*, *Gilg in Engl*. " *Bot. Jahrb*.," 40, 481.

Transvaal.—Derdepoort, *Miss Leendertz* 190. Rustenburg Div. : Rustenburg, *Miss Leendertz* 9773. Pretoria Div. : Betfontein. *Theiler in Herb. Transvaal Museum* 12365 ; Kaalplaats, *Mogg in Govt. Herb*. 16289.

THE GENUS OCHNA.

By E. P. PHILLIPS, M.A., D.Sc., F.L.S.

THE National Herbarium has on many occasions received specimens of *Ochna* from the Forest Department for identification, but found that the naming of the species in herbaria was unsatisfactory. Forest officers have suggested that more species are found in the South African forests than those generally accepted as occurring within the Union, and as some of the species are of economic value it was pointed out by the Chief Conservator of Forests that the genus should be critically examined. With the permission of the Chief of the Division of Botany the writer undertook this work. Without the cordial co-operation of the Forest Department this would not have been possible, and my appreciation is here expressed of the willing assistance received from Mr. J. J. Kotze, B.A., B.Sc., the acting Research Officer at the time. To the various forest officers who have supplied specimens and information the writer is also deeply indebted, especially to Mr. A. J. O'Connor, the District Forest Officer at Doornboom, northern Transvaal, who first pointed out the existence of two distinct species of *Ochna* which occur in the Woodbush Forest, and which had previously been regarded as either *O. arborea* or *O. atropurpurea*, var. *natalitia*. My thanks are also due to the Director of the South African Museum, who allowed me facilities for working at the Cape Government Herbarium, and to Dr. S. Schönland, Mrs. F. Bolus, B.A., Mrs. R. Potts, and Dr. P. J. van der Bijl for lending me the material in their respective herbaria, and to the Director of Kew for comparing some specimens with the Kew material.

At first sight the division of the genus into species appeared an easy matter, but as more material was examined the difficulties of limiting the species increased. The writer has critically examined nearly 200 herbarium sheets, but failed to find any constant characters, either floral or vegetative, which could be used as diagnostic characters for a key to the species, and has had to rely on the general " facies " of the specimens in most cases and has found it difficult to express the differences in words. That the specimens have been grouped correctly may be assumed, as handling a large number of specimens makes one familiar with their "look," but whether a particular specimen can be readily placed in its correct species with the aid of the key given here is more doubtful. However, this difficulty will only apply to a few species related to *O. atropurpurea*; the others are fairly distinct.

In the " Flora Capensis " (Vol. I, 448), three species of *Ochna* are described, but my investigations show that there are nine distinct species in South Africa with the possibility of a tenth. This latter is represented by two sheets illustrating a plant with a prostrate habit, but as Harvey, in the " Flora Capensis " under *O. arborea*, mentions that " shoots from the roots occasionally produce flowers," it is just possible that the specimens may represent such shoots, but no information on this point is available. In all the herbarium specimens examined only *O. pulchra* was correctly distinguished, while the limits of *O. arborea* and *O. atropurpurea* were confused. *O. pulchra* is a typical Transvaal species, but also occurs in Rhodesia, and as far as our records go is absent from the Cape Province and Natal. It is readily distinguished from all the other South African species by the large racemose inflorescence. Other distinguishing characters are the entire leaves (or they usually appear entire to the naked eye) and the long stigmas, which are one-third to a quarter the length of the style. The other species which has entire (or apparently so) leaves is *O. arborea*, but this does not occur in the Transvaal. It has been recorded from the George, Kynsna, Uitenhage, Albany, Stockenstrom, East London, Kingwilliamstown, Komgha, and Kentani Divisions, and then appears in Natal and extends to Lourenco Marques The inflorescence in this species is also racemose (a very abbreviated raceme), but specimens have passed through my hands in which the flowers are either solitary or 2–4-nate at the apex of short shoots; this is, however, very rare. The third species, *O. atropurpurea*, as I have limited it, is composed of plants of a shrubby habit, 2–3 ft. high, and can usually be recognised at a glance by the branches having a distinct lepidote appearance due to the presence of numerous prominent lenticels; the leaves are usually elliptic, sharply serrated, and the flowers solitary. It has a similar distribution to *O. arborea*, but has also been recorded from Zululand and Barberton. The variety *natalitia* has been kept as a distinct species: it differs from *O. atropurpurea* in habit, and the branches have not the lepidote appearance; the flowers are rarely solitary, and the leaves longer and lanceolate. Though Harvey recognized this variety, he has nevertheless confused it with the species, as in the Cape Government Herbarium there is a sheet (*E. and Z.* 925) labelled on the ticket *O. atropurpurea* and written up as such in Harvey's handwriting, which is undoubtedly *O. natalitia*. This species is not so common in the south-eastern districts as *O. atro purpurea*, but is recorded from several localities in Natal, and then passes through Swaziland to Barberton. Ecklon and Zeyher record it from the Uitenhage Division. The correct limitation of this species has proved the most troublesome, and at first I was inclined to recognize three species. A further examination proved that the first grouping of the specimens was very artificial and that this species should be regarded as a variable one with a wide range of distribution. *O. Chilversii* appears to be confined to the eastern forests, it resembles *O. natalitia* in general habit, but is readily distinguished from this species by the larger number of carpels in the ovary, and the flowers are usually much larger. The two species, *O. O'Connorii* and *O. Holstii*, which occur in the Woodbush Forest are very distinct from all the other South African species. Both are deciduous trees of timber size, and may perhaps be confused in herbaria if leaves are only present, but they differ considerably. *O. Holstii* has a rough bark and ellipsoid fruits, while *O. O'Connorii* has a smooth bark with kidney-shaped fruits. The remaining species, *O. leptoclada*, is found in the Barberton and Lydenberg Districts and also in Rhodesia. Specimens in mature foliage are easily recognized by the oblanceolate leaves, which are long attenuated at the base.

The African species of *Ochna* were monographed by Diels in 1904 (Engl., "Bot. Jahrb.," Vol. XXXIII, p. 232), to which account the reader is referred for a key to all the known African species.

The writer was granted facilities by Mr. Kotze for extracting information about the species from notes sent to the Forest Department by various forest officers.

O. Chilversii. This species is known in the Cwebe Forest by the natives as "sibomvu." The Conservator of Forests, Transkeian Conservancy, remarks: "I was struck with the nice appearance of the wood. It is a soft (hardwood), easy to work. . . . It is plentiful in the Cwebe and other coast forests and approximates *arborea* in size, and could easily be exploited. Possibly it might make an excellent hammer handle." Mr C. C. Robertson remarks on the difference between this species and *O. arborea*. He reported that the "wood, which seems to me far from soft, appears to have the same general character as boxwood, and would probably be suitable for similar purposes," and he suggested that it might be tried for whatever purpose *O. arborea* is used for. The forester at Cwebe, who has handled the wood, describes it as "easy to work and soft."

In the Notinsela Forest the natives know the tree as "umbomvane umncince," and according to Mr. F. M. Fegen the tree occurs both in the Notinsela and Mpimbo Reserves, and appears to be plentiful in the latter locality, and no doubt also in the surrounding forests.

Forester Chilvers mentions that he has only seen one specimen in the Ingeli Forest Reserve. He describes it as a "small tree, stem 5 inches in diameter; bark not smooth as in *O. arborea*; leaves not diciduous."

O. Holstii. This species occurs in the Ingeli Forest Reserve and is also found in the Woodbush Forest in the northern Transvaal. The specimens in the Ingeli Reserve, Forester Chilvers describes as "trees of timber size with deciduous leaves; stem attaining to a diameter of 2 ft. to 2 ft. 6 in. with a rough bark." The species is quite plentiful at Ingeli and is known to the sawyers as the "real red pear" as distinguished from *Scolopia.* Forester Tustin describes this species as "a branched tree 40–50 ft. high, stem 18 in. in diameter, with a bole 15–20 ft. Bark grey on the outside and deep red inside. Flowers in September and October and fruits ripen in December. I have only found the tree growing in denser parts of the forest. It is found throughout my patrols (Impetyne and Ingeli) and is sparingly dotted through the forests. Saplings are numerous compared with old trees. I have not seen this tree used for any purpose."

District Forest Officer A. O'Connor, in submitting specimens from the Woodbush Forest, states it to be "a fairly large deciduous tree. The bark is comparatively smooth, though not with the hard smoothness of *O. O'Connorii,* being more flaky and 'chippy.'" It is beet-red under the surface.

Mr. O. Miller (the acting District Forest Officer at Doornboom at the time) states that the species is fairly abundant in the lower, but scarce in the upper, slopes of the Woodbush Forest. It attains a height of 45 ft., with a trunk diameter, at breast high, of 30 in. The species flowers in November and sets its fruits in January.

O. O'Connorii. This tree has only been recorded from the Woodbush Forest, and was collected by Mr. A. J. O'Connor. He noted the differences between this and *O. arborea,* and describes it as a "small tree with smooth bark, very much like the ordinary Cape plane." The local name is "rooihout," "rooi izerhout."

O. arborea. This species may attain the size of a timber tree or may be only 8–10 ft. high. In the Horseshoe Forest, Kingwilliamstown, Forester Whithal records this species as a "tree 30 ft. high, with a diameter of 26 in. at breast high, and is found on a dolerite formation." At Knysna, Mr. J. D. Keet, the District Forest Officer, records it "as common in all parts of the district, being a small tree which forms part of the under storey of the forest. and rarely reaches a height of 1 ft. at breast high." Locally known as the "rooihout." The wood is very strong and of great durability, and is generally used for making handles of tools and axes. The seeds are said to be attacked by caterpillars. Forester Watton states it to be a plant growing in scrub at Knysna, and is known by the name of "rooihout." Forester Strauch sends the following notes with his specimens: "Very plentiful in all the reserves in this (Alexandria) forestal district, and is found throughout the forest. Average height, 10 ft.; average girth, 4 in. In the kloofs it grows much larger and it is found that the bark is much lighter than in trees growing on ridges or exposed positions. The timber is used for making axe and hammer handles. The tree appears to grow more or less plentifully over the forests in the Alexandria District, which are all on sandy soil."

Sim* is in error when he states that this species occurs in the Transvaal.

O. natalitia. This species, which has been regarded as a variety of *O. atropurpurea,* rightly deserves specific rank. Forester F. M. Fegen reports it as a "small tree about 6 ft. high growing at Notinsela Forest. It is very free in flowering and has scented flowers. I have seen several specimens of this tree in the Mpimbo Forest, but it does not appear to grow higher than 6 or 8 ft. Many young plants of *O. atropurpurea* are growing close to this." Forester Fegen further remarks that both species (*O. natalitia* and *O. atropurpurea*) grow on the edge of the forest and appear to be gregarious, growing thickly together. I have not found them well in the forest. Many stunted plants are in "dobo" grass, and have been scorched by fire and have thrown out branches from the base. This species should make a handsome garden plant, and fruiting specimens are particularly beautiful. The Pondos call it "mbomvane ncinci," but do not appear to use it for any purpose.

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* Sim, "Forest Flora," p. 164.

O. atropurpurea. Forester Fegen records this as a "small shrub growing to edge of Maseko Forest and which is very plentiful. It has flowered and fruited very sparingly this year (1915) and fruiting specimens are scarce. The leaves, although identical in shape, are smaller on every specimen than those of *O. natalitia.* It is also found at Notinsela. Galls are nearly always present, and the plants, like *O. natalitia,* are confined to the edge of the forest."*

O. pulchra. A small or large tree, 6–20 ft. high. The trunk is smooth and usually white, which makes the recognition of this tree in the veld easy. It is usually in flower late in September, and at the end of October the sepals take on a red colour which makes the species so conspicuous. The young fruits are then forming, and they mature in December. The flowers are sweetly scented ; at first the sepals are bright green, then change to olive-brown and red. The seeds are said to be poisonous.

KEY TO SPECIES.

- Inflorescence in definite long or short racemes, sometimes panicled, very rarely solitary or 2–3-nate at the apices of short shoots, but if so then the leaves entire or appearing entire to the naked eye.
  - Ovary of 10–13 carpels.................... *Chilversii.*
  - Ovary of less than 10 carpels.
    - Leaves entire or appearing entire to the naked eye (rarely serrated, but if so, then never with prominent lenticels), not acuminate ; bark smooth.
      - Racemes 2–12 cm. long.................... *pulchra.*
      - Racemes much abbreviated.................... *arborea.*
    - Leaves serrated, long acuminate, branches not densely covered with prominent white lenticels ; fruit ellipsoid.................... *Holstii.*
    - Leaves serrated, shortly acuminate or cuneate at the apex, rarely rounded ; branches sometimes covered with prominent white lenticels ; fruits ellipsoid or kidney-shaped.
      - Fruits kidney-shaped ; lenticels not numerous and prominent ; a tall tree.
        - Leaves obtuse ; Transvaal species.................... *O'Connorii.*
        - Leaves acute ; Eastern species.................... *arborea.*
      - Fruits ellipsoid, lenticels numerous and prominent ; a large shrub 6–8 ft. high.................... *natalitia.*

- Inflorescence solitary or 2–4-nate arising from tha apex of abbreviated shoots.
  - Small trees or erect shrubs.
    - Mature leaves up to 9 cm. long, oblanceolate, usually long-attenuate at the base.................... *leptoclada.*
    - Mature leaves very rarely up to 8 cm. long, rounded or narrowed at the base, never long-attenuate.
      - Flowers 2–5-nate on much abbreviated shoots from the axils of the leaves.................... *natalitia.*
      - Flowers solitary, very rarely 2–5-nate, but then arising from the apex of short shoots and not in the axils of the leaves.
        - Lenticels usually dense and prominent, giving the branches a lepidote appearance to the naked eye ; teeth on the margins of the leaves usually triangular in shape, erect, and acute.................... *atropurpurea.*
        - Lenticels usually present, but branches not appearing lepidote to the naked eye ; teeth on margins of leaves usually incurved.
          - Epidermis flaking from the branches in membranous strips ; leaves up to 4 cm. long.. *pretoriensis.*
          - Epidermis rarely evidently flaking in membranous strips ; leaves up to 8 cm. long.. *natalitia.*

O. Chilversii Phillips. *Arbor* parva. *Cortex* sulcata. *Folia,* 3–8 cm. longa, 6–2·5 cm. lata, lanceolata, apice obtusa, basi cuneata, glabra, marginibus serratis. *Inflorescentia* in racemo brevissime disposita. *Ovarium,* 10–13 carpellis.

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* Sim, "Forest Flora," p. 164.

A small tree with a trunk 5 in. in diameter. *Bark* rough. *Branchlets* with reddish-brown to almost black bark, pustulate or not, not flaking. *Leaves* 3–8 cm. long, ·6–2·5 cm. broad, lanceolate, rarely more or less oblanceolate, obtuse, cuneate at the base and passing into a short petiole, rarely rounded, with the midrib distinct above and beneath and the lateral veins evident or not, with serrated margins, glabrous. *Inflorescence* on short shoots in abbreviated racemes, up to 7-flowered. *Pedicels* 1·7–2·2 cm. long, terete, articulated 1–3 mm. from the base, glabrous. *Sepals* 1·4 cm. long, ·7 cm. broad, ovate, obtuse, and rounded at the apex ; two of the sepals cucullate at the apex, glabrous (in dried specimens the folding of the sepals gives them the appearance of being acuminate). *Petals* 1·7 cm. long, 1·4 cm. broad, obovate, rounded at the apex, narrowed at the base into a short broad claw. *Filaments* 5·5 mm. long ; anthers 3 mm. long, linear-oblong in outline, dehiscing by two apical slits. *Ovary* of 10–13 carpels, about 1 mm. long ; style 1 cm. long, somewhat compressed ; stigmas either capitate or saucer-shaped, with the stigmatic surfaces arranged round the rim. *Fruit* unknown.

Eastern Region.—Cwebe Forest, July, *Pretorius in Herb. Forest Dept.* 1625 ; Notinsela Forest, *Fegen in Herb. Forest Dept.* 1817 ; Ingeli Forest Reserve, December, *Chilvers in Herb. Forest Dept.* 1945 ; at mouth of Umkwani River, October, *Tyson*, 2619.

O. pulchra (Hook. fil., Ic. Pl. t. 588).

A small or large tree, 6–20 ft. high. *Branches* usually white or light grey to brown in colour, quite smooth or rough, with the epidermis peeling off in membranous flakes. *Leaves* subsessile, 3·5–11 cm. long, 1·5–5 cm. broad, usually elliptic, sometimes elliptic-lanceolate, rarely oblanceolate, rounded or obtuse at the apex, sometimes mucronate, usually narrowed at the base, more rarely rounded or subcordate ; margins entire or appearing entire to the naked eye, more rarely with subulate teeth adpressed to the margins, with the mid-rib prominent beneath and the lateral veins distinct, glabrous. *Inflorescence* a many-flowered raceme, 2–12 cm. long. *Pedicels* 1–2·5 cm. long, glabrous, articulated at the base. *Sepals* 6–8 mm. long, 5 mm. broad, elliptic or suborbicular, obtuse, sometimes with cartilaginous teeth on the margins. *Petals* 7·5–9 mm. long, 4·5–5·5 mm. broad, obovate, narrowed at the base. *Filaments* 2 mm. long ; anthers 1·5–2 mm. long, oblong or oblong-linear in outline. *Ovary* of 5–7 carpels ; style 2 mm. long ; stigmas as many as the carpels, about one-third to a quarter as long as the style, recurved, with faintly bilobed apices. *Fruit* 1·1–1·3 cm. long, 8 mm. in diameter, kidney-shaped, and attached to the torus at the middle.—"*Flora Capensis*," *I*, 449.

Transvaal.—Northern Transvaal without precise locality, *Becker in Herb. Albany Mus.*; Pretoria District : Premier Mine, *Rogers* 19846 ; Magaliesberg, October, *Burke* 302, *Schlechter* 3623 ; Meintjes Kop, September, *Robertson in Herb. Forest Dept.* 1662 ; kopjes round Pretoria, September, *Miss Leendertz* 300, 381, May, *Burtt-Davy* 2449 ; Koedoespoort, September, *Miss Stent in Govt Herb.* 10527 ; Wonderboom, October, *G.A.Z. in Herb. Forest Dept.* 1686, *Mogg in Herb. Forest Dept.* 1673 and *in Govt. Herb.* 11509, *Galpin* 6977, *Burtt-Davy* 2678 and *in Herb. Forest Dept.* 545, *Miss Leendertz* 431. Rustenburg Dist. : Plains at foot of Magaliesberg, *Miss Pegler* 1032 ; Wolhuterskop, *Howlett in Govt. Herb.* 16176, *Pole Evans in Govt. Herb.* 15843 ; Silikats Nek, De Kroon, *Putterill in Govt. Herb.* 16176 ; Rustenburg, *Miss Leendertz* 3369. Waterberg Dist. : Warmbaths, *Burtt-Davy* 2626 ; Leeuwpoort Tin Mines, *Rogers* 19071, 21874 ; Pietpotgietersrust, *Burtt Davy* 2289, *Miss Leendertz* 5635, 2392, *Collector* (?) *in Herb. Bolus* 10a ; Chunies Poort, *Pole Evans* 19460.

Rhodesia.—Veld, Victoria Falls, August–October, *Miss Gibbs* 305 ; sandy soil, Victoria Falls, 3000 ft., *Rogers*, 5301, 5302, 5423 ; in open forest, Victoria Falls, 2900 ft., *Galpin* 7050 ; Livingstone, 3000 ft., October, *Rogers*, 7450 ; Victoria, *Monro* 1594, 2108.

This species is usually in flower late in September, and at the end of October the sepals take on a red colour which makes the plant so conspicuous. The young fruits are then forming and they mature in December. The flowers are sweetly scented; at first the sepals are bright green, then change to olive-brown and red. The seeds are said to be poisonous.

O. arborea (Burch. *ex* D.C. Prodr. 1, 736).

A shrub 8 ft. to a tree 30–40 ft. high. *Bark* smooth. *Branches* with light or dark grey bark, with prominent lenticels and with the epidermis often peeling in membranous flakes. *Leaves* subsessile, 1·5–6·5 cm. long, 0·8–3 cm. broad, mostly elliptic more rarely lanceolate-elliptic or obovate, obtuse or rounded at the apex, rarely acute, narrowed or rounded at the base, quite entire or appearing so to the naked eye, very rarely distinctly serrated ; teeth when present more or less subulate and adpressed to the margin of the leaf (except *Wood* 5878, in which the serrations are distinct). *Inflorescence* less than 1 cm. long, in a much abbreviated raceme of 3–7 flowers, very rarely solitary or 2–3-nate at the apex of short shoots. *Pedicels* 0·7–1·2 cm. long, articulated about 1 mm. from the base. *Sepals* 6·5 mm. long, 3·5–5 mm. broad, elliptic or ovate-elliptic, rounded at the apex. *Petals* ·75–1·3 cm. long, 3–5·5 mm. broad, oblong or oblong-obovate, cuneate at the base. *Filaments* 2·5–3 mm. long ; anthers 1·5 mm. long, oblong in outline. *Ovary* of 4–6 carpels ; style 5·5–6 mm. long ; stigmas as many as the carpels, or sometimes stigma subglobose. *Fruit* ellipsoid or almost kidney-shaped, attached to the torus at the middle.—"*Flora Capensis*," *I*, 449 ; *Sim*, "*Forest and Forest Flora*," 163 *pl. xxix*.

George Dist. : George, August, *Rogers* 4039 ; Woodville Forest, George, *Sim in Herb. Forest Dept.* 3116, 3117. Knysna Dist. : Knysna Commonage, *Keet* 498 ; Christies Kloof, Gouna, near Knysna, *Collector* (?) *in Herb. Forest Dept.* 1342 ; Gouna River, September, *Keet in Herb. Forest Dept.* 2529 ; Kaffirkop Forest, *c.* 1500 ft., January, *Watton in Herb. Forest Dept.* 2943 ; De Eiland, *Rabbets in National Herb.* 1420, 1421. Uitenhage Dist. : Oliphants Hoek and Addo, September–October, *E. and Z.* 924 ; Zuurberg, *Drège*. Alexandria Dist. : Forests near Alexandria, *Strauch in Herb. Forest Dept.* 2012, 3013, 3005. Albany Dist. : Blaauw Krantz Bridge, October, *Galpin* 265 ; without precise locality, *E. and Z.* ; Bothas Hill, December, *Salisbury* 357 ; Salentown, *Zeyher* ; near Grahamstown, *MacOwan* 110. Stockenstrom Dist. : Katberg *Mrs. Hobson* 1446. East London Dist. : Coast near East London, April, *Sim* 2153 ; East London, July, *Miss Gane* 260 ; near Nahoon River, August, *Galpin* 3291. Kingwilliamstown Dist. : Along the Buffalo River, near Kingwilliamstown, November, *Flanagan* 359 ; Horseshoe Forest, December, *Whithal in Herb. Forest Dept.* 2941 ; Mkobisa Forest, December, *Van der Merwe in Herb. Forest Dept.* 2939 ; Western Pirie Forest, January, *Kopke in Herb. Forest Dept.* 2940. Victoria East Dist. : Auckland Forest, January, *Ackermann in Herb. Forest Dept.* 2942. Komgha Dist. : Woods near Prospect Farm, November, *Flanagan* 359. Kentani Dist. : Forest near Kentani, July, *Miss Pegler* 1216. Pondoland, Mpingo Forest, *Fegen in Herb. Forest Dept.* 3033, 3089.

Natal : Port Natal, *Gueinzius* ; Inanda, August, *Wood* 687, and *in Natal Govt. Herb.* 5878 ; without precise locality, *Gerrard and McKen* 834, and *in Natal Govt. Herb.* 73 ; Victoria County, *Wood* ; Shafton, Howick, *Mrs. Hutton* 153.

Delagoa Bay : *E. and Z.* 926 ; *Madame Borle* 176, 16 ; *Rogers* 21373.

A large shrub (*Wood*). A forest tree, 15 ft. high, with masses of yellow flowers (*Miss Pegler*). A small tree throughout the whole of the Knysna Forest ; generally used for making handles of tools and axes ; wood very strong and heavy and of great durability ; seeds attacked by caterpillars (*Herb. Forest Dept.* 1342).

O. O'Connorii, Phillips. Arbor. *Cortex* plana. *Folia* 5–10 cm. longa, 1·3–5 cm. lata, lanceolata, raro elliptica vel ovato-lanceolata, apice paullo angustata, obtusa, *Inflorescentia* in racemo brevissime disposita ; flores solitarii vel 2–3-nati. *Fructus* 1·5 cm. long, 8 cm. latus, reniformis.

A tree. *Bark* comparatively smooth, somewhat flaky and "chippy," beet-red beneath the surface (*O'Connor*). *Branchlets* somewhat pustulate, reddish-brown to dark-brown in colour, not flaking. *Leaves* 5–10 cm. long (usually 6–8 cm. long), 1–3·5 cm. broad, lanceolate, rarely elliptic or ovate-lanceolate, slightly tapering at the apex, rarely acuminate or rounded and retuse, obtuse, sometimes slightly tapering to the base and rounded, with the mid-rib prominent above and beneath and the lateral veins distinct above ; glabrous. *Inflorescence* racemose with the flowers either solitary or 2–3-nate in the raceme. *Pedicels* 1–2·2 cm. long, articulated 1–4 mm. from the base. *Sepals* 7 mm. long, 5 mm. broad, broadly elliptic, rounded at the apex. *Petals* 1·1–1·2 cm. long, 5–6·5 mm. broad, obovate, rounded above, narrowed into a short broad claw at the base. *Filaments* 2·5 mm. long, anthers 2·5 mm. long, linear-oblong in outline. *Ovary* of 5–6 carpels ; style 5·5 mm. long ; stigmas as many as the carpels. *Fruit* 1·5 cm. long, 0·8 cm. broad, kidney-shaped, attached to the torus at the concave side.

TRANSVAAL.—Barberton Dist. : Van der Merwes Bush, Pilgrims Rest, 5–5750 ft., January, *Burtt-Davy* 1409 ; Barberton, February, *Orangie in Colonial Herb.* 1691 ; *Legat in Colonial Herb.* 1316. Pietersburg Dist. : Woodbush Forest, October, *Grenfell* 3, and in *Colonial Herb.* 1017 ; *Dwyer* ; December–January, *Botha in Herb. Forest Dept.* 2929, 2934 ; *Legat in Herb. Transvaal Mus.* 9711 ; by stream at Potatobush, *c.* 4750 ft., January, *Burtt-Davy* 1193 ; *Eastwood in Colonial Herb.* 1286 ; Woodbush, 4900 ft. October, *O'Connor in Herb. Forest Dept.* 2198 ; *Lane-Poole in Herb. Forest Dept.* 547 ; *Grenfell in Colonial Herb.* 1112 ; without collector in *Herb. Forest Dept.* 542.

Known as the Cape Plane, Rooihout, Machailo, Rooi Yzerhout, Morelle.

O. Holstii (Engl. in Engl. Pflanzenw. Ostafr. c. 273).

A tree of timber size. *Bark* rough. *Branchlets* varying in colour from light to dark brown, scarcely pustulate, not flaking. *Leaves* deciduous, 5–8 cm. long, 0·8–2 cm. broad, lanceolate, acuminate, obtuse at the apex, narrowed at the base into a short petiole, mid-rib distinct above and beneath, lateral veins not evident, with the margins serrated and with the serrations very erect, glabrous. *Inflorescence* on short shoots in abbreviated racemes, up to 7-flowered. *Pedicels* 1·3–2·7 cm. long, terete, articulated 1–3 mm. from the base. *Sepals* 1 cm. long, lengthening in the fruit, 0·5 cm. broad, elliptic, rounded at the apex, glabrous (in dried specimens the folding of the sepals gives them the appearance of being acuminate). *Petals* 8 mm. long, 5 mm. broad, obovate, rounded at the apex, narrowed at the base into a short broad claw. *Filaments* 5 mm. long ; anthers 2 mm. long, oblong in outline, dehiscing by apical slits. *Ovary* of 4–5 carpels about 1 mm. long ; style 6 mm. long ; stigma globose, faintly lobed. *Fruit* ellipsoid, attached to the torus at one end.

EASTERN REGION.—Tembuland, Engcobo Mtn., *Flanagan* 2696. Natal : Ngomi, *Tustin in Herb. Forest Dept.* 3115 ; Ingeli Forest Reserve, December–January, *Chilvers in Herb. Forest Dept.* 1944, 1946 ; *Tustin in Herb. Forest Dept.* 2907, 2984.

TRANSVAAL.—Pietersburg Div. : Woodbush, December, *Botha in Herb. Forest Dept.* 2935 ; 4900 ft., November, *O'Connor in Herb. Forest Dept.* 2197 ; without collector in *National Herb.* 1242. Lydenburg Div. : Pilgrims Rest, Van der Merwes Bush, 5400–5750 ft., January, *Burtt-Davy* 1408 ; Drakensberg at Pilgrims Rest, *Collector* (?) *in Herb. Forest Dept.* 549. Barberton Div. : Barberton, *Rogers* 14996.

This tree flowers in November and sets its fruits in January, The sawyers call it the "real red pear" as distinct from *Scolopia.* In the Woodbush it is known as "rooi yzerhout."

O. natalitia (Engl. *et* Gilg. in Engl. "Bot. Jahrb.," 33, 236 ; name only).

Large shrub or small tree. *Branches* usually with prominent lenticels, often numerous, but not appearing lepidote to the naked eye. *Leaves* subsessile, 2–9 cm. long, 0·5–2·5 cm. broad, usually lanceolate, more rarely lanceolate-elliptic or lanceolate-linear, cuneate or slightly narrowed at the base, very rarely rounded at the base, obtuse or rounded at the apex, with serrated, very rarely entire margins, with the teeth usually incurved ; the mid-rib distinct above and beneath and the lateral vein evident. *Inflorescence* either solitary or 2-nate from the apex of short shoots, or 2–5-nate arising in the axils of the leaves, very rarely in abbreviated racemes. *Pedicels* 0·4–1·5 cm. long, articulated at the base or

1 mm. from the base. *Sepals* 7–8 mm. long, 4·5–5·5 mm. broad, elliptic or rounded at the apex. *Petals* 0·9–1·2 cm. long, 6–7 mm. broad, obovate, narrowed at the base. *Filaments* 1·5–2 mm. long ; anthers 1·5–2·5 mm. long, oblong in outline. *Ovary* of 5–9 carpels : style 4·5–6·5 mm. long ; stigma either discoid or stigmas as many as the carpels. *Fruit* 0·8–1·4 cm. long, 5–9 mm. in diameter, ellipsoid, more rarely subglobose.—*O. atropurpurea*, var. *natalitia*, "*Flora Capensis*," *I*, 448 ; *Sim*, "*Forest and Forest Flora*," *p*. 163.

Coast Region.—Uitenhage Div. : Uitenhage, May, *E. and Z.* 935 ; Motinsele Forest, December, *Fegen in Herb. Forest Dept.* 1816, 1818.

Eastern Region.—Natal : Berea, 200 ft., August, *Wood* 10060 ; *Wood in Natal Govt. Herb.* 10062, 10064 ; without precise locality, *Wood* 6418 ; near Durban, *Wood* 72 ; Benvie, Karkloof, 4000–500 ft. *Wylie in Natal Govt. Herb.* 10826 ; (*Wood* 10034) ; Umzinyati, 200–500 ft., October, *Wood* 11458 ; without precise locality, *Cooper* 1252.

Orange Free State : Elandshoek, September, *Rogers in Herb. Transvaal Museum* 2587.

Swaziland.—Komassan Valley, Havelock Concession, July, *Galpin* 983.

Transvaal.—Without precise locality, *Miss Stent, in Herb. Transvaal Mus.* 8779. Pietersburg Div. : The Downs, *Rogers* 22133 ; Tzaneen, *Rogers* 12540. Barberton Div. : Umvoti Creek, near Barberton, 3000 ft., November, *Galpin* 660 ; *Rogers* 20267 ; Nelspruit, October, *Breyer in Herb. Transvaal Mus.* 17701 ; between White River and Nelspruit, *Burtt-Davy* 1510 ; Carolina, September, *Roberts in Herb. Transvaal Mus.* 15874.

O. leptoclada (Oliv., "Fl. Trop. Afr." I. 318).

A bush, 2–3 ft. high (*Galpin*). *Branches* somewhat pustulate with ash-grey bark and with the epidermis peeling off in membranous flakes. *Young leaves* 2·5–6·5 cm. long, 0·6–1 cm. broad, lanceolate, subacute, tapering at the base, with serrated margins, sometimes subentire. *Mature leaves* 5–11·5 cm. long, 1·4–3·4 cm. broad, mostly oblanceolate, sometimes lanceolate-elliptic, rounded at the apex, usually long-attenuate at the base, more rarely only narrowed, with the mid-rib prominent above and beneath, and the lateral veins distinct, with serrated margins, rarely subentire. *Inflorescence* mostly unbellate on abbreviated shoots, 3–4-flowered, sometimes flowers solitary. *Pedicels* 1–2·5 cm. long, articulated at the very base. *Sepals* 7 mm. long, 5 mm. broad, obovate or elliptic, rounded at the apex. *Petals* 1 cm. long, ·5 cm. broad, obovate, rounded at the apex, narrowed into a claw at the base. *Filaments* 3·5 mm. long ; anthers 1·5 mm. long, oblong-linear. *Ovary* of 5 carpels ; style 4·5 mm. long ; stigma capitate. *Fruit* about 6 mm. in diameter, subglobose.

Transvaal.—Barberton Div. : Barberton, November, *Rogers* 18264, and *in Herb. Transvaal Mus.* 15976 ; mountain sides, Moodies, near Barberton, September–October, 3500 ft. *Galpin* 590 ; mountains near Barberton, *Bolus* 7693. Lydenburg Div. : Pilgrims Rest, *c.* 3500 ft., October, *Rogers*, 23068, and *in Herb. Transvaal Mus.* 20541.

Rhodesia.—North-West Rhodesia : Pemba, 3500 ft., October, *Rogers* 8579 ; Ndola, October, *Allen*, 304 ; Chilanga, 3500 ft. *Rogers* 8455. Umtali Div. : Odanzi River Valley, *Teague* 399, 497.

Belgian Congo : Elisabethville, 4800 ft., *Rogers* 10194.

O. atropurpurea [DC. in "Ann. Mus. Par.," XVII (1811), 412].

Small shrub, 3–5 ft. high. *Branches* densely covered with prominent lenticels giving them a lepidote appearance to the naked eye. *Leaves* subsessile, 0·8–5 cm. long, 0·4–1·9 cm. broad, usually elliptic, rarely elliptic-ovate, elliptic-oblong, or elliptic-lanceolate, more rarely lanceolate, obtuse, rounded or slightly narrowed at the base, with serrated margins and the teeth usually triangular erect and acute, more rarely incurved, with the mid-rib prominent above, and lateral veins evident. *Flowers* solitary at the apex of short shoots, very rarely 2-nate. *Pedicels* 1–1·5 cm. long, articulated at the base or about 1 mm. from the base. *Sepals* 6–7 mm. long, 3–6 mm. broad, elliptic, elliptic-ovate or elliptic-oblong, rounded at the apex. *Petals* 0·9–1·3 cm. long, obovate, cuneate at the base. *Filaments* 2–2·75 mm. long; anthers 2–3·5 mm. long, oblong or linear in outline. *Ovary* of 5–6 carpels; style 5–7 mm. long; stigmas as many as the carpels. *Fruit* 7 mm. long, about 5 mm. in diameter, subglobose.—"*Flora Capensis,*" *I*, 448; *Sim,* "*Forests and Forest Flora,*" *p.* 163, *pl. xxix, fig.* 2.

Cape Province.—Caledon Div.: Genadendal, 2500 ft., April, *Schlechter* 7749; Bedford, June, *Miss Nicol* 49. Knysna Div.: Woods at Knysna, *Newdigate in Herb. Albany Museum; Watton in National Herb.* 1419. Port Elizabeth Div.: Van Stadens, September, *Mrs. Patterson* 737, *MacOwan in Cape Govt. Herb.* Albany Div.: Howisons Poort, near Grahamstown, *MacOwan in Herb. Austro-Afric.* 1766; Rockliffe, near Sidbury, November, *Miss Daly* 771; Grahamstown Commonage, 2000 ft., September, *Schönland* 570; rocky hills near Grahamstown, 2000–2500 ft., August, *Galpin* 48; near Grahamstown, September, *MacOwan* 111; and in *Natal Govt. Herb.* 850; January, *Breyer in Herb. Transvaal Mus.* 16866; Signal Hill, near Grahamstown, 2200 ft., September, *Bolus* 1920. Queenstown Div.: Among rocks on hillside, Junction Farm, Queenstown, 2500 ft., *Miss Wiggill in Herb. Galpin* 8257. East London Div.: East London, December, *Breyer in Herb. Transvaal Mus.* 16544. Komgha Div.: Wood near Prospect Farm, November, *Flanagan* 322. Stockenstrom Div.: In bush at Willisdale, September, *Scully* 77; Kat River, *Bartels*; Katberg Forest, January, *Stapels in Herb. Forest Dept.* 2937, 2938 Stutterheim Div.: Stutterheim, December, *Rogers* 12726; Transkei, Umtata, *Convent School Herb.* 194; Kentani, 1200 ft., October, *Miss Pegler* 194; rocky spots near Bazya, 2000 ft., October, *Baur* 258; Maseko Forest, Negeleni, December, *Fegen in Herb. Forest* Dept. 1819; Pondoland, Mgazama River, near McAllister's Drift, Port St. Johns, *Miller in Herb. Forest Dept.* 3024.

Natal.—Near Umkomaas River, October, *Tyson* 2659; Natal Bay, *Gueinzius*; without locality, *Wood* 190.

Zululand.—Qudeni Forest, 6000 ft., January, *Davis* 108.

Transvaal.—Barberton Div.: Near Barberton, September, *Bolus.* A small stunted shrub. Plentiful on edge of forest, but does not appear to seed freely (*Fegen*).

Var. **angustifolia,** Phillips. Differs from the type in having smaller, narrower lanceolate leaves.

Transvaal.—Barberton Div.: Margin of wood, upper Moodies, 4500 ft., June, *Galpin* 963, and *in Natal Government Herb.* 8761. Ermelo Div.: Nooitgedacht, December, *Mrs. Pott* 5096, and *in Herb. Transvaal Mus.* 14933. Lydenburg Div.: Between Pilgrims Rest and Sabi, *Rogers* 23410.

Swaziland.—Havelock Concession, *Saltmarsh in Herb. Galpin.* A shrub 3 ft. high (*Galpin*).

O. pretoriensis, Phillips ("Flowering Plant S. Afr.," vol. ii).

Branchlets with light to dark-brown bark, peeling in membranous strips, not distinctly pustulate. *Leaves* 1·5–3·8 cm. long, 0·5–1·7 cm. broad, lanceolate, obovate, elliptic, or oblanceolate (mostly oblanceolate), obtuse at the apex, cuneate, more rarely rounded at the base, with serrated margins and with the mid-rib distinct and lateral veins evident. *Flowers* solitary, very rarely 2-nate, arising at the apex of abbreviated shoots. *Pedicels* 1–1·5 cm. long, articulated at the base or 1–2 mm. above the base. *Sepals* 7–8 mm. long, 4–5 mm. broad, ovate or elliptic, rounded at the apex, sometimes 2–3-lobed at the apex, enlarging in fruit. *Petals* 1·5 cm. long, 8·5 mm. broad, obovate, rounded at the apex, narrowed at the base into a claw. *Filaments* 4·5 mm. long; anthers 2 mm. long, oblong in outline. *Ovary* of 4–5 carpels; style 5 mm. long; stigmas as many as the carpels. *Fruit* 7–8 mm. long, 5–6 mm. broad, more or less ellipsoid.

TRANSVAAL.—Pretoria Div.: Below River Redoubt, Daspoort Rand, October (fruits), *Pole Evans* 157; Pretoria, December (fruits), *Nelson in Herb. Transvaal Mus.* 11709; February (fruits), *Miss Leendertz* 65, *and in Herb. Transvaal Mus.* 4199; November (flowers) *Miss Leendertz* 301; Meintjes Kop, March (fruits), *Pole Evans* 353; Kopje near Gezina, *Phillips in National Herb.* 1422; *Fouche in National Herb.* 1491; Moorddrift, October (fruits), *Leendertz* 2131, and *in Herb. Transvaal Mus.* 7333; Rikatla, October (fruits), *Junod* 147, and *in Herb. Transvaal Mus.* 20146; near Messina, *c.* 1800 ft., November (fruits), *O'Connor in Herb. Forest Dept.* 1936; Messina, October (fruits), *Rogers* 19398, 20029, 19244, and *in Herb. Transvaal Mus.* 17762.

THE GENUS OLINIA.

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THE genus *Olinia* was founded by Thunberg in 1799 ("Roem. Arch.," II, i, 4, 1799), and belongs to the natural order *Lythrarieae*. The genus contains important forest trees, and was first dealt with in this connection by Sim in his "Forests and Forest Flora," p. 227. Sim only recognized one species, viz. *O. cymosa*, but divided this into three varieties, as follows:—

Var. *latifolia*, mostly in the Western Province.
Var. *intermedia*, found in the Midland Conservancy and sparingly elsewhere.
Var. *acuminata*, the common form in the Eastern and Transkeian Conservancies.

The examination of all the material in the South African herbaria has led us to regard var. *latifolia* and var. *intermedia* as belonging to the species *O. cymosa*, and var. *acuminata* as a distinct species which Klotzsch first named *O. acuminata*. The leaf characters which Sim gives for the first two varieties are not constant in the areas in which they are stated to occur, and we have failed to find even constant varietal characters. The var. *acuminata* which has again been raised to specific rank can easily be distinguished from *O. cymosa* by the shape of the petals and, to a lesser degree, by the shape of the leaves. In the former the petals are "linear-spathulate" (Pl. II, figs. 2, 3), while in the latter (*O. cymosa*) the petals are "obovate-spathulate" (Pl. I, figs. 2, 3). These characters, in conjunction with its distinct distribution, all point to the tree being quite distinct from *O. cymosa*. It is the plant which Sim has figured on Plate LXXII in his work cited above.

In the "Index Kewensis" two other specific names are mentioned, viz. *O. ternata*, Gilg and *O. micrantha*, Dcne. As no other descriptions of these were available in South Africa, the Director of Kew was asked for assistance. In a letter from Kew received in January, 1921, it is stated that "the name *O. ternata*, Gilg is apparently not yet published but Gilg determined a specimen himself collected by Mrs. H. Hutton at Howisons Poort near Grahamstown as this species." There can be no doubt that this is *O. cymosa*. From the description of *O. ternata*, Decne., kindly sent to us by the Director of Kew, we also have no hesitation in confirming this to be *O. cymosa*. Decaisne founded his description on *Burchell* 3592, which was not represented in any of the South African herbaria. Another species from Zululand and East Pondoland was named by Dr. Stapf as *O. radiata* but the name has not been published. As this name is now known to foresters, we do not propose to change it.

The Curator of the Botanical Department of the British Museum was good enough to furnish a scrap of *Welwitsch* 991 collected at Huilla and stated to be *O. cymosa*, but an examination of this makes it very doubtful whether *O. cymosa* does occur in tropical Africa. This has now been confirmed by Kew, as the Director writes: "*Welwitsch* 991 is not represented at Kew, but reference to the British Museum material leads us to agree that it is distinct from *O. cymosa*. It very closely resembles *O. usambarensis* (*Holst* 9115)."

Through the courtesy of the Forest Department, we have been able to give some notes on two of the species, *O. cymosa* and *O. radiata*.

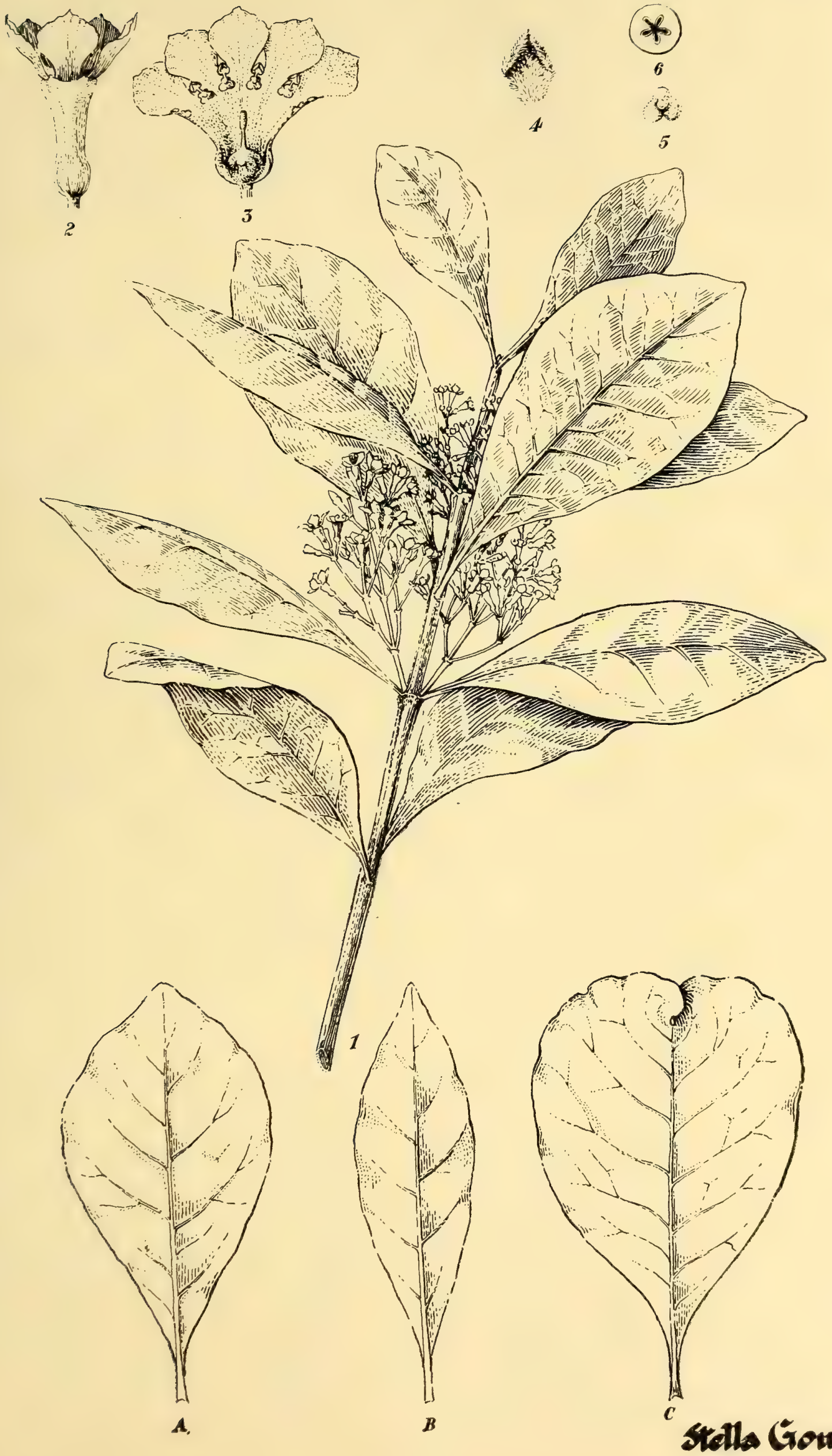
Mr. J. D. Keet, District Forest Officer, Knysna, writes regarding *O. cymosa* : " Found in all forests in Knysna and Zitzikamma Districts, mostly in forests on the coastal plateau at elevations of 700 to 900 ft. approximately, less frequent in the forests on the foothills and mountain ravines and scarce in the coastal scrub. Its total range is from 300–400 to 2000 ft. approximately. It is comparatively intolerant of shade and superflous soil moisture, and generally avoids cool slopes, ravines, low-lying ground, and streams. It is often a forerunner of the forest-like ' Keur ' (*Virgilia capensis*), ' Beech ' (*Myrsine melanophleos*), etc., and like the Sneezewood (*Ptaeroxylon utile*), it prefers the crests of ridges, rocks, and stony ground. Other conditions being suitable, it grows equally well on soils originating from Table Mountain Sandstone, Bokkeveld, Conglomerate, and old sand-dunes (?). The result is that it is found mostly on ridges on the north and west slopes near the crest of a ridge, the edge of the forest, and frequently in small groups or as isolated trees in the ' fijnbos.' It is a medium-sized tree in height and usually in bole. The thickest I have measured is 15 ft. in girth, the largest bole 32 ft., and the greatest height 70 ft. (estimated). The thicker trees are often somewhat gnarled, fluted, and buttressed, and with unsound heartwood. Where exposed to the full light it forms full-foliaged and much-branched symetrical crowns on low stems. This is generally the case in older trees which have been a forerunner of the forest. The bark is thin, usually dark, and decorticating in scales on the lower part of stems of older trees ; sometimes reddish or brownish pigment shows in the cracks and under the scales. Bark on the smaller branches smooth and grey. At a glance in the forest the bark may sometimes be confused with that of ' Quar ' (*Plectronia obovata*). The wood is used in wagon work (such as felloes, spokes, long-wagon poles), fencing and telegraph poles, railway sleepers, furniture, etc. The plant coppices freely, and coppice shoots are vigorous on small and medium sized trees, but usually too dense, in which case all may die back at a height of 6–8 ft., when fewer will reach pole size in twenty to twenty-five years. On stools of trees felled in 1917 at Harkerville the coppice is now 6–8 ft. high. Seedlings occur sparingly in open space in worked-out forests and in the ' fijnbos ' edge, but are absent in dense forest. Several attempts to germinate the seeds in nurseries have either failed completely or given very poor results. Seedlings and saplings in the forest are fairly fast growing. In the forest a rough and ready test by which the tree may be recognized is the strong prussic acid or almond smell of the leaves, twigs, freshly-cut bark, and sapwood. The name ' mountain hard pear ' is applied to this species."

O. radiata. This is said to be the largest tree growing in the Ingeli Forest, and is over 12 ft. girth at breast high. The District Forest Officer, Transkeian Conservancy, reports " that the bark has a strong almond-like smell, and when placed in water turns it a blue-black colour. The wood is used for felloes." Forester Fegen, in submitting specimens of the tree, states : " This tree grows to a large size and is very plentiful in the Izinja, Ngododo, Qakama, Maseko, and neighbouring forests, and is not found elsewhere in the district. The young wood is quadrangular, usually red in colour, as are the leaves. Flowers white with a tinge of purple in small dense clusters. Fruit plum-shaped, reddish purple in colour when ripe, is eaten by birds, and I hear by natives. The tree flowers about November and the fruit is ripe about July. The wood is reported to be hard and durable, but nothing is really known about the tree here. Young trees and saplings are used by the natives." Forester Leigh gives the native name of the tree as " umpanzi," and states that sawyers confuse this with " umpanzite " (*Phyllanthus amapodensis*) as the wood is the same. It is fairly abundant in the Ntsubane Forest. Forester Leigh also states that he only knows of it growing between Umsikaba and Umzimhlava Rivers, and that it is a large semi-deciduous tree 60–70 ft. high with a girth of 10–12 ft. Old trees grow out in ribs near the ground. Used for wagon work (naves, felloes, etc.), and believed to make a good charcoal. It is plentiful in parts of the Ntsubane Forest, but on the whole scarce.

O. acuminata. We have not been able to obtain any special information about this species, but in the Woodbush Forest, Pietersburg, Transvaal, it is known as " roodebosje."

The distribution of the three species found in South Africa is fairly well defined.

Plate I.


2
3
4
6
5
1
A.
B
C
Stella Gower.

Olinia cymosa, Thunb.

Olinia cymosa extends from the Cape Peninsula along the coastal belt as far as the Kei mouth, beyond which we have no record of its occurrence. MacOwan collected the species at Somerset East, which is the only record of its inland occurrence.

Olinia radiata. Is found in the Pondoland forests and extends as far as Ingeli in Natal.

Olinia acuminata. This is an inland species. The most southern record is at Queenstown, and from there it extends to the slopes of the Drakensberg in East Griqualand to the mountainous districts of the eastern Transvaal (Barberton), and occurs again in the Woodbush Forest in the Pietersburg District. An outlier of the species is recorded from the Magaliesberg in the Transvaal.

The flowers are largely infected by a Hemiptera larva which appears to arrest their development, which is reflected in the length of the calyx-tube. In some specimens the calyx-tube is much longer than the petals, in other it equals the petals, while specimens are found in which the calxy-tube is shorter than the petals. All gradations are found even on the same specimen.

Two specimens of *O. cymosa* differ slightly from the other specimens of the species examined in that the petals are rounded at the apex and not bluntly pointed (East London, *Rattray* 840, Somerset East, *Bolus* 1772), but in specimens collected by *Flanagan* near the Kei mouth both forms of petals occur.

KEY TO SPECIES

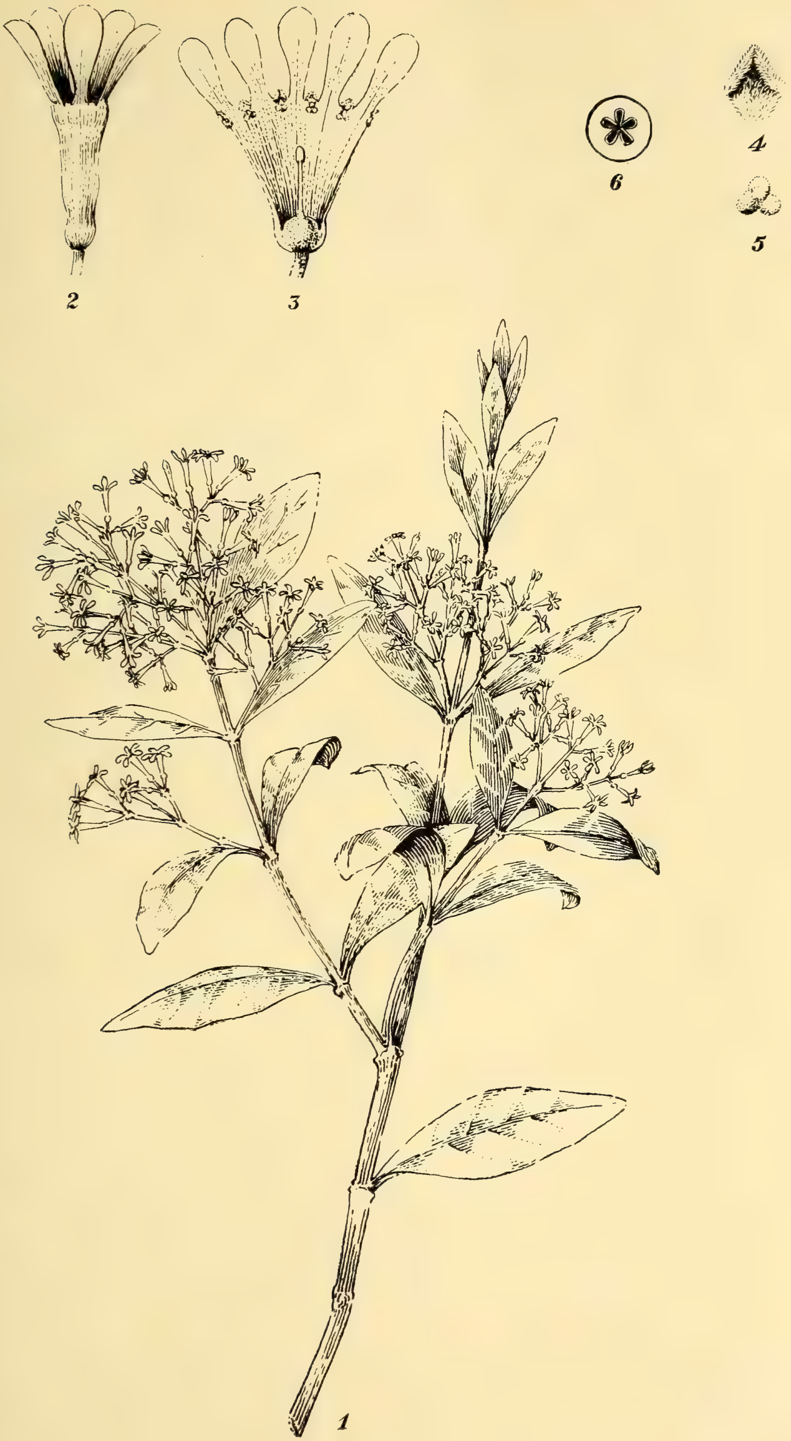
- Petals obovate-spathulate .... *cymosa.*
- Petals linear-spathulate.
  - Inflorescence lax, about half as long as the subtending leaf .... *acuminata.*
  - Inflorescence compact very much shorter than the subtending leaf .... *radiata.*

Olinia cymosa, Thunb., "Flora Capensis," 194. (Plate I.)

Branches glabrous. *Leaves* 3·7 cm. long 1–3·5 cm. broad, lanceolate, obovate, elliptic, acuminate, obtuse, sometimes rounded at the apex, narrowed at the base into a distinct petiole, margins entire, sometimes wavy, glabrous, green and shiny above, paler beneath. *Inflorescence* axillary, a dense trichotomous cyme, very much shorter than the subtending leaf. *Bracts* opposite, same length as the flowers, often deciduous. *Penduncles* minutely pubescent. *Calyx-tube* 1-6 mm. long, glabrous or minutely hairy with five minute teeth. *Petals* five, inserted at the throat of the tube, about one-third the length of the calyx, rarely equalling it, spathulate, acute or obtuse at the apex, with a cluster of hairs at the base. *Scales* five incurved, alternating with the sepals, minute, obovate, densely hairy. *Stamens* five, adnate to calyx below the scales; filaments very short. *Ovary* inferior, five-celled, with three pendulous ovules from a central placentum in each cell; style subulate; stigma obtuse. *Fruit* globose, 1 cm. in diameter.—*"Flora Capensis," II*, 520, *Excl. var. acuminata*; *Sim. "Forest and Forest Flora,"* 227. *Excl. var. acuminata, pl. LXXII, fig.* 14.

CAPE.—Slang Kuil, Table Mountain, October, *MacOwan in Herbarium Austro-africanum* 927; Kirstenbosch, Table Mountain, November, December, *Harvey*, July, *Zeyher* 179 and 244; August, *L. Kensit in Herb. Bolus Austro-africana* 10748; Table Mountain, August, *M. Page in Herb. Afric. Bolusianum* 1633; Devil's Peak, September, *Zeyher*; Paarl, August, October, *Drège*; Hottentot Hollands Mts., July, *Zeyher*; Swellendam, Voormansbosch, October, *Zeyher*; Grootvadersbosch, October, *Pappe* 130, *Zeyher*, 2434; Knysna, Commonage forests, August, *J. D. Keet in Herb. Forestry Dept.* 2336; May, *Scott-Elliot in Forest Dept. Herb.* 1349; Collector (?) *Forest Dept. Herb.* 1350. Port Elizabeth: September, *I. L. Drège in Herb. Albany Museum* 541; August, *F. Paterson in Herb. Africanium Bolusianum* 2320, 2319, 1155; August, *Dom. Honseley in Herb. Albany Museum.* Humansdorp: August, *F. A. Rogers in Herb. Albany Museum* 3016. Van Stadens: September, *T. V. Paterson in Herb. Albany Museum* 230. Bethelsdorp: September, *T. V.*

Plate 11.



Stella Gower.

Olinia acuminata, Klotz.

Paterson in Herb. Albany Museum 2151. Somerset East: November, *H. Bolus* 1772. Grahamstown: "Amos's Vil," *MacOwan* 349; August, September, *E. E. Galpin in Herb. Albany Museum* 88. Howisons Poort: September, *Schönland* 818; *Zeyher* 2465. East London: October, *Geo. Rattray in Herb. Albany Museum* 840; Kei Mouth, July, *Flanagan* 2341.

Olinia acuminata, Klotz in "Otto and Dietr. Allg. Gartenz," IV (1836), 27 (Pl. II).

Branches glabrous. *Leaves* 2–3 cm. long, 0·5–1·5 cm. broad, lanceolate, elliptic, acuminate, narrowed at the base into a more or less distinct petiole, with entire margins, glabrous, green and shiny above, paler beneath. *Inflorescence* an axillary trichotomous cyme, a little shorter than the subtending leaf. *Bracts* deciduous. *Calyx-tube* 2–9 mm. long, glabrous or minutely pubescent, with five minute teeth. *Petals* five, inserted at the throat of the calyx-tube, about one-third the length of the calyx, linear, rounded at the apex, with a small tuft of hairs at the base. *Scales* five, incurved, alternating with the petals, minute, obovate, densely hairy. *Stamens* five, adnate to calyx below the scales; filaments very short. *Ovary* inferior, five-celled, with three pendulous ovules from a central placentum in each cell; style subulate; stigma obtuse. *Fruit* globose, 3 mm. in diameter.—"*Flora Capensis,*" *II*, 520. *O. cymosa, var. acuminata*; *Sim*, "*Forests and Forest Flora,*" 227.

Cape.—Queenstown, Rockwood, Bongolo, February, *E. E. Galpin* 2500. Transkei, Kaffraria, January, *T. R. Sim* 2026; June, 2099.

Natal.—Maclear, Pot. River Berg, March, *E. E. Galpin* 6628, 6629; Drakensberg, May, *J. Medley Wood* 4957; Giant's Castle, June, *R. E. Simons in Herb. Trans. Museum* 15965.

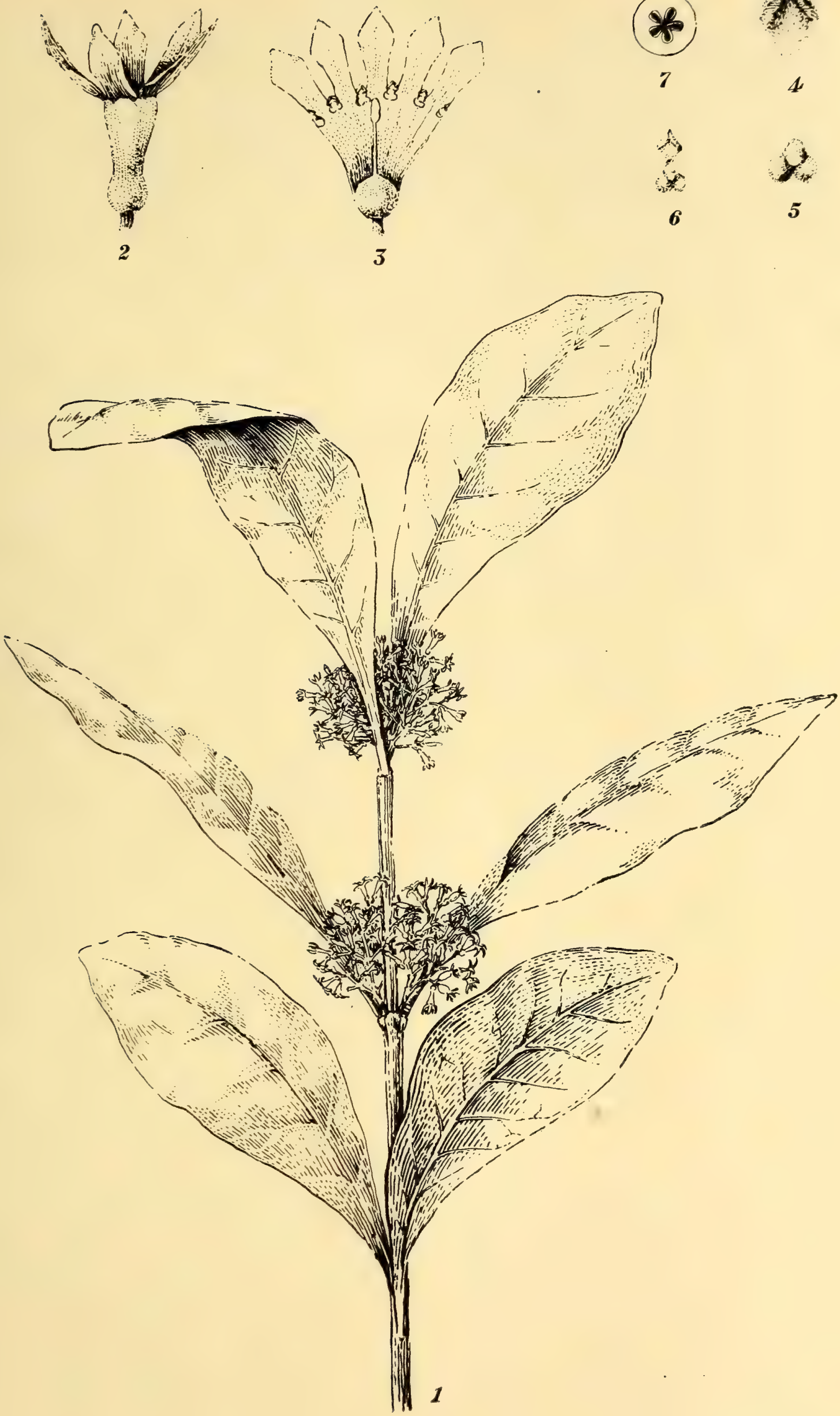
Transvaal.—Barberton, Upper Moodies, January, *E. E. Galpin* 1275; Rustenburg, January, *Olive Nation in Herb. Bolusianum* 1906; Magalisberg, *Zeyher* 494; Woodbush, northern Transvaal, January, *O. J. O. O'Connor in Forest Dept. Herbarium* 1458; Dulstroom, January, *F. O. Noome in Herb. of Trans. Museum* 20812; Elandspruitberg, December, *R. Schlechter* 3864.

Olinia radiata, sp. nov. (Plate III). *Rami* glabri. *Folia* 5–8 cm. longa, 1·8–3·8 cm. lata, lanceolata, obovata, lanceolato-elliptica vel elliptica, subacuminata, apice obtusa vel aliquando subrotundata, basi angustata. *Inflorescentia* axillaria, compacta. *Pedunculus* minute pubescens. *Calyci tubus* 1·4 mm. longus, glaber vel minute pubescens. *Petala* 1·2 mm. longa, linearia, spathulata, apice acuta. *Squamae* minutae, obovatae, pilosae.

Branches glabrous. *Leaves* 5–9 cm. long, 1·8–3·8 cm. broad, lanceolate, obovate, lanceolate-elliptic, or elliptic, mostly subacuminate, obtuse, more rarely rounded at the apex, narrowed at the base into a more or less distinct petiole, margins entire and usually wavy, glabrous. *Inflorescence* axillary, a dense trichotomous cyme, very much shorter than the subtending leaf. *Bracts* opposite, smaller than the flowers, deciduous. *Peduncles* minutely pubescent. *Calyx-tube* 1–4 mm. long, glabrous, or minute hairy; teeth very minute. *Petals* five, inserted at the throat of the calyx-tube, 1–2 mm. long, linear-spathulate, acute, with a small tuft of hairs at the base. *Scales* incurved, alternating with the petals, minute, obovate, densely hairy. *Stamens* five, adnate to the calyx below the scales; filaments very short. *Ovary* inferior, five-celled, with three pendulous ovules from a central placentum in each cell; style subulate, stigma obtuse. *Mature fruit* globose, 1·8 cm. in diameter.

Transkei: Ngadodo Forest, Ngqeleni, November, *Fegen in Herb. Forest Dept.* 2286, and in *Government Herb.* 18361; September, *Fegen in Herb. Forest Dept.* 2490. Pondoland: Ngadu Forest Station, May, *Van der Vyvier in Herb. Forest Dept.* 2472. Lusikisiki Dist.: Ntsubani Forest, *A. Leigh in Herb. Forest Dept.* 2051, 1553; Mpanzi, February, *A. Leigh in Herb. Forest Dept.* 1839. Natal: Ingeli Forest Station, November, *C. W. Chilvers in Herb. Forest Dept.* 1942; Impetyne, February, *J. S. Henkel in Herb. Forest Dept.* 2382.

Plate III.



Stella Gower.

Otinia radiata, Phill. and Hofmeyr.

EXPLANATION OF PLATES.

Plate I.—*Olinia cymosa*, Thunb.
- Fig. 1. Portion of branch.
- Fig. 2. Flower.
- Fig. 3. Longitudinal section of flowers showing stamens, scales, ovary, and style.
- Fig. 4. Scale.
- Fig. 5. Cross-section of ovary.
- Fig. 6. Stamen.
- Figs. A, B, C. Types of leaves.

Plate II.—*Olinia acuminata*, Klotz.
- Fig. 1. Portion of branch.
- Fig. 2. Flower.
- Fig. 3. Longitudinal section of flower.
- Fig. 4. Scale.
- Fig. 5. Stamen.
- Fig. 6. Cross-section of ovary.

Plate III.—*Olinia radiata*, Phill. and Hofmeyr.
- Fig. 1. Portion of branch.
- Fig. 2. Flower.
- Fig. 3. Longitudinal section of flower.
- Fig. 4. Scale.
- Fig. 5. Stamen.
- Fig. 6. Stamen and scale.
- Fig. 7. Cross-section of ovary.

THE GENUS CYCLOPIA, VENT.

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Division of Botany, Pretoria.

THE genus *Cyclopia* was founded by Ventenat in 1808. Two years later a plant, now known as *Cyclopia genistoides*, was figured in the *Botanical Magazine*, t. 1259, and described as the type of a new genus, viz. *Ibbetsonia*. In 1825 the genus *Cyclopia* was dealt with in De Candolle's " Prodromus " (Vol. II, p. 101), and three species described, and it was not until 1861 that Harvey revised the genus in the " Flora Capensis " (Vol. I, p. 6). Since Harvey's account nothing has been written on the genus, but in the interval much material has accumulated in local herbaria which extends our knowledge of the species.

Several species of *Cyclopia* have become of some commercial value locally as the source of " bush tea," and it was with the object of clearly defining the known species as a foundation on which any future experimental work might be based that this revision of the genus was undertaken.

Harvey in the " Flora Capensis " recognized nine species, but our examination of all the available local material has led us to subdivide the genus into twelve very distinct species. The species are all shrubs with ternate, very often revolute leaves, and yellow flowers. They are mostly confined to the Western Province and the south-eastern regions, but one species extends as far as Port Elizabeth. According to observations made by Forest Officers, most of the species grew well in all situations and soils, except on stiff clayey soils. The cultivation of the species used as " bush teas " should be experimented with, and should not prove difficult, though the young seedlings may require some shelter until firmly established.

The method at present used for preparing " bush teas " for local consumption is to heat the leaves in an oven for about an hour to produce " sweating," after which they are dried in the sun. When thoroughly dry the leaves and smaller twigs are removed from the stem and larger branches, packed, and sold under various names. If the demand for " bush tea " is sufficiently great, cultivation trials will be justified, as it may then be possible to put a superior article on the local market.

Our thanks are due to the Curators of the Albany Museum Herbarium, the Cape Government Herbarium, the Transvaal Museum Herbarium, and the Forest Department for allowing us to examine the material in their respective herbaria.

C. genistoides. The District Forest Officer, Elgin, Caledon District, reports : " This species grows on the slopes of mountains and hills, and is found in fairly large quantities on the Groenland Range, near Elgin. It grows to approximately 3 ft. in height. The leaves and flowers are sun-dried." Known as " honey tea."

C. tenuifolia. The District Forest Officers, Elgin, Caledon District, reports : " This species is not unlike the ' honey tea ' (*C. genistoides*) ; the flowers are similar in colour and appearance, but the leaves are finer and longer. It is sun-dried before being used, and has a stronger flavour." Known as " vlei tea."

C. brachypoda. The District Forest Officer, Elgin, Caledon District, reports: "The leaves are broader and longer than the other two species (*C. genistoides* and *C. tenuifolia*). It also flowers later. It is found in large quantities throughout the Caledon and Swellendam Districts, and shares popularity with 'honey tea' (*C. genistoides*) as a beverage amongst the poorer classes. It is prepared in a similar manner to 'honey and vlei tea,' known as 'Heidelberg tea.'"

C. subternata. The District Forest Officer at Grootvadersbosch, Swellendam District, reports: "This variety is known as the 'common bush tea,' and thrives abundantly along the slopes of the Langeberg Mountain Range in the Divisions of Swellendam and Riversdale, and large quantities are available each year. The flowering season is generally in the month of August. Large quantities are collected on private ground, the bulk of which is used by poor whites and coloured people, very little being sold owing to the small amount (1½d. per ℔.) offered by local buyers after preparation." A form of this species is known as "Hottentot's tea," and according to the District Forest Officer at Grootvadersbosch, "only small quantities of this tea can be found growing, especially in the heart of the Langeberg Mountain Range. Flowering season in August. Very little tea is collected annually."

C. Ashtonii. The District Forest Officer at Grootvadersbosch, Swellendam District, states: "This tea, like *C. subternata*, thrives well along the mountain slopes of the Langeberg, but prefers the damper places. Consequently, the only large patches are found on the mountain side. The flowering season is about November, which is practically the only time that this tea is collected, and then only in small quantities." Locally known as "vlei tea."

C. Burtonii. The Conservator of Forests, Knysna, reports: "It is known in the Zwartberg Mountains as 'heuning or sugar tea.' The shrub grows to a height of 1½–18 in., and is only found in a few places on the Zwartberg Mountains. Apparently it grows at a higher altitude than the ordinary 'bush tea,' and appears able to stand the frost better."

CYCLOPIA, Vent.

Erect branched shrubs. *Leaves* sessile, palmately trifoliate: leaflets narrow-linear, lanceolate or very rarely ovate, glabrous or pubescent, frequently with revolute margins; stipules none. *Peduncles* axillary, one-flowered, with two, rarely three, bracts at the base. *Flowers* bright yellow. *Calyx* subequally 5-cleft, with an intruse base. *Vexillum* roundish, plaited at the base and with a short claw; alae oblong, with a transverse fold; carina incurved, obtusely rostrate, with a small triangular pocket. *Stamens* separate or slightly connate at the base; filaments dilated. *Ovary* glabrous, several ovuled. *Legume* oblong, compressed, with coriaceous valves.

KEY TO SPECIES.

- Plants glabrous or nearly so.
  - Leaflets flat or with slightly recurved margins.
    - Bracts three .... 1. *Burtonii.*
    - Bracts two.
      - Leaflets ovate, cordate or truncate at the base .... 2. *latifolia.*
      - Leaflets elliptic, oblong or sublanceolate-linear, obtuse or acute.
        - Pedicels exceeding the small obtuse or acute bracts; lobes of the calyx equalling the tube or rarely shorter .... 3. *subternata.*
        - Pedicels the same length as the bracts; the lobes of the calyx exceeding the tube .... 4. *brachypoda.*
      - Leaflets linear or filiform with strongly revolute margins.
        - Bracts very broad, obtuse .... 5. *tenuifolia.*
        - Bracts boatshaped, acute .... 6. *genistoides.*

Plants villous or pubescent at least on the younger parts.
  Bracts ribbed, recurved at the apex.. 7. *pubescens.*
  Bracts smooth, straight.
    Flowers pedicellate.
      Calyx glabrous.
        Leaflets linear, strongly revolute.................................. 8. *galioides.*
        Leaflets narrowly ovate, cordate at the base, slightly revolute.. 9. *Ashtonii.*
      Calyx softly hairy.. 10. *Bolusii.*
    Flowers subsessile.
      Lobes of the calyx falcate.. 11. *sessiliflora.*
      Lobes of the calyx oblong, not falcate................................ 12. *montana.*

1. **C. Burtonii,** sp. nov.

Rami glabri. *Foliola* subsessilia, 0·6–1·2 cm. longa, 2 mm. lata, lanceolato-elliptica, apice acuta, plana, marginibus leviter reflexis. *Bracteae* 3, 1–2 mm. longae, lanceolatae, apice acutae. *Calyx* 3 mm. longa ; lobi ovato-acuminati. *Vexillum* 8·5 mm. longum, 6 mm. latum, apice acutum ; ala oblonga ; carina rostrata.

Oudtshoorn Division : Zwartberg Mountains, November, *Burton in Herb. Forest Dept.* 2914.

A much-branched glabrous shrub, 30–37 cm. high. *Leaflets* subsessile, 0·6–1·2 cm. long, 2 mm. broad, lanceolate-elliptic, acute at both ends, flat, with slightly reflexed margins. *Bracts* three, 1–2 mm. long, lanceolate, acute, equalling the pedicel ; one adnate to the pedicel and smaller than the other two. *Calyx* 3 mm. long ; lobes ovate, acuminate, longer than the tube. *Vexillum* 8·5 mm. long, 6 mm. broad, acute ; alae narrow-oblong ; carina very obtusely rostrate.

2. **C. latifolia** (D.C., Prodr., 2, p. 101).

Plant glabrous. *Stem* strongly ribbed. *Leaflets* sessile, 0·5–2·3 cm. long, 0·3–1·5 cm. broad, ovate, mucronate, cordate or truncate at the base, with entire slightly recurved margins ; the middle leaflet the longest. *Bracts* two, 0·5 cm. long, sharp pointed, as long as or almost as long as the pedicel, persistent. *Pedicel* 0·8–1 cm. long. *Calyx* 0·5 cm. long ; segments acute, slightly falcate, as long as the tube ; the lowest segment longer and minutely toothed at the base.—"*Flora Capensis,*" *II*, 6.

Cape Division : Table Mountain, October, *Bodkin in Herb. Bolus* 8038.

3. **C. subternata** (Vog. Linn. 10, p. 595).

A branched glabrous shrub. *Stems* ribbed. *Leaflets* 1·25–3·75 cm. long, 2–5 mm. broad, elliptic, oblong or lanceolate, acute or obtuse, flat, with reflexed margins. *Bracts* two, 2 mm. long, rarely 4 mm. long, broadly ovate, mucronate, shorter than the pedicels. *Pedicel* 4–11 mm. long. *Calyx* 4–5 mm. long ; lobes deltoid, obtuse or subacute, as long as or shorter than the tube.—*C. Vogelii, Harv.*, var. *subternata, Harv.*, "*Flora Capensis,*" *II*, 6.

George Division : Without precise locality, September, *District Forest Officer in Herb. Forest Dept.* 3112. Port Elizabeth Division : Port Elizabeth, *Patterson* 863 ; Witte Els Bosch, Zitzikama, September, *Galpin* 3899. Riversdale Division : Muis Kraal, near Garcias Pass, October, *Galpin* 3900 ; *Phillips in Herb. Musei Austro-Afric.* 1991 ; Toll House, 1700 ft., October, *Bolus* 11249. Swellendam Division : Grootvadersbosch, *District Forest Officer in Herb. Forest Dept.* 2844, 2845. Cape Division : Capetown, October, *Tyson.* Paarl Division : French Hoek, September, *Bolus.* Tulbagh Division : Witsenberg Vlakte, November, *Zeyher.* Knysna Division : Knysna, September, *Keet in Herb. Forest Dept.* 2539 ; Plettenberg Bay, *Zeyher.* Ceres Division : Koude Bokkeveld, September, *Schlechter* 8922, *Burchell* 5549. Oudtshoorn Division : Zwartbergen, 3000 ft., October, *Schlechter* 5583. Humansdorp Division : Mountains near Humansdorp, *Herb. Bolus* 1056 ; near French Hoek, *c.* 2400 ft., November, *Bolus* 5151 (in this specimen the base of the calyx is intruse and thus the lobes appear to be longer than the tube.

Specimens collected by Gatherstone at Cango and by Kennedy at Humansdorp compare well with *C. subternata*, except that they have a split fleshy calyx.

4. **C. brachypoda,** comb. nov.

A glabrous shrub. *Stems* ribbed. *Leaflets* 1·25–2·5 cm. long, 2–3 mm. broad, lanceolate or narrow-linear, acute or obtuse, flat, with reflexed slightly wavy margins. *Bracts* two, 4–6 mm. long, ovate-lanceolate, acuminate, very acute, as long as the pedicel. *Calyx* 5–7 mm. long; lobes longer than the tube, falcate, acute.—*C. Vogelii, Harv., var. brachypoda, Harv.,* "*Flora Capensis,*" *II*, 6.

Paarl Division: French Hoek, October, *Phillips* 1097. Tulbagh Division: Witsenberg, December, *Ecklon* and *Zeyher* 1147; September, *Zeyher* 354.

Var. **intermedia.** *Bracts* and *pedicels* 1 mm. long. *Leaves* 6–8 mm. long, 2 mm, broad, very obtuse.—*C. Vogelii, Harv.*, var. *intermedia*, "*Flora Capensis,*" *II*, 7; *C. intermedia, E. Mey Com.*, p. 3, *exel. lit c.*

Caledon Division: Without precise locality, *District Officer in Herb. Forest Dept.* 2841. Riversdale Division: Langeberg, Riversdale, August, *Muir* 843.

A specimen collected at Elgin in the Caledon Division (*Herb. Forest Dept.* 2891) compares well with *C. brachypoda*, but the material is insufficient to be quite certain of the species.

5. **C. tenuifolia** (Lehm. Linn. 5, p. 373).

Plant glabrous. *Stem* ribbed. *Leaflets* 1·25–5 cm. long, linear-filiform, with revolute margins. *Bracts* two, 3 mm. long, 5 mm. broad, folded longitudinally and overlapping each other, obtuse or truncate, strongly keeled, glabrous without, sparsely hairy within. *Pedicel* 1·25–1·75 cm. long, elongating in fruit. *Calyx* 5 mm. long; lobes as long as the tube, acute, with slightly woolly margins; the lowest lobe longer and broader than the others, minutely toothed at the base. *Legume* oblong, with a recurved mucro at the apex; valves leathery.—"*Flora Capensis,*" *II*, 7.

Caledon Division: Elgin, October, September, *District Forest Officer in Herb. Forest Dept.* 2840, 3114. Swellendam Division: River Zonder Einde, *Zeyher* 2257. Riversdale Division: Corento River Farm, Riversdale, November, *Muir* 50, and *in Herb. Galpin* 5072.

6. **C. genistoides** (Br. Hort. Kew., ed. 2, vol. 3, p. 5).

Stem ribbed, glabrous or nearly so. *Leaflets* 1·25–3·75 cm. long, narrow-linear, with strongly revolute margins. *Flowers* in a dense mass near the ends of the branches. *Bracts* 5 mm. long, acute and mucronate at the apex, boat-shaped, folded longitudinally, glabrous without, with a few scattered hairs on the inner surface. *Pedicel* 6–8 mm. long. *Calyx* 8–11 mm. long; lobes longer than the tube, broadly falcate, with a mucronate apex, margins woolly; lowest segments longer than the others and toothed at the base.—"*Flora Capensis,*" *II*, 7.

Caledon Division: Caledon, August, *Rogers* 11017; October, *Bolus*; *District Forest Officer in Herb. Forest Dept.* 2842. Cape Division: Tokai Plantation, September, *Herb Forest Dept.* 1052; Cecelia Plantation, *Ross in Herb. Forest Dept.* 3113; near Capetown, October, *Bolus* 7272; Devil's Peak, November, *MacOwan* 1113, and *in Herb. Musei Austro-Afric.* 6546; Constantia, September, *Schlechter* 1461. Stellenbosch Division: Stellenbosch, October, *Mrs. De Jongh in Herb. Galpin* 4390. Swellendam Division: Swellendam, *Ecklon* and *Zeyher*. Clanwilliam Division: Clanwilliam, *Mader in Herb. Austro-Afric.*

7. **C. pubescens** (E. and Z. Enum. No. 1146).

Stem pubescent. *Leaflets* 1·25–3·75 cm. long, about 1 mm. broad, narrow-linear, with revolute margins, pubescent, at length becoming almost glabrous. *Flowers* densely massed. *Bracts* 4–6 mm. long, almost as broad, ribbed, acuminate, recurved at the apex, pubescent, shorter than the pedicel. *Pedicel* 1·25–1·75 cm. long, villous. *Calyx* 8 mm. long, pubescent; lobes taper-pointed from a broad base, twice as long as the tube.—"*Flora Capensis,*" *II*, 8.

Port Elizabeth Division : Port Elizabeth, September, *Drège in Herb. Albany Museum* 167.

8. **C. galioides** (D.C., Prodr. 2, p. 101).

Young branches ribbed, densely villous, at length becoming almost glabrous. *Leaflets* arising from a thick flattened node, 1·25–2·5 cm. long, up to 4 mm. broad, linear, with strongly revolute margins, with a recurved mucro at the apex, truncate at the base, pubescent when young. *Bracts* 4–6 mm. long, ovate-lanceolate, acuminate, longer than the pedicel. *Pedicel* 2–4 mm. long. *Calyx* 6–13 mm. long, glabrous ; lobes broadly falcate, acuminate, longer than the tube.—"*Flora Capensis,*" *II*, 8.

Cape Division : Fish Hoek, May, *Bolus in Herb. Norm. Austro-Afric.* 67 ; Muizenberg, *Zeyher ;* Simonstown, February, *Compton.*

9. **C. Ashtonii,** sp. nov.

Rami sericei. *Foliola* 1·75 cm. longa, 4 mm. lata, basi cordata, marginibus revolutis. *Bracteae* 4 mm. longae, ovatae, ciliatae, intus villosae. *Calyx* 8 mm. longus ; lobi falcati.

Swellendam Division : Langeberg Mountains, *Ashton in Herb. Forest Dept.* 2843.

Young branches silky. *Leaflets* from a thick flattened node, up to 1·75 cm. long, 4 mm. broad, thick, cordate at the base, with revolute margins, paler beneath. *Bracts* 4 mm. long and slightly broader, ovate, ciliate, villous on the inner surface. *Calyx* 8 mm. long ; lobes broadly falcate.

10. **C. Bolusii,** sp. nov.

Rami villosi. *Foliola* 1·2 cm. longa, apice mucronata, marginibus revolutis, villosa. *Bractae* 6 mm. longae, ovatae, acuminatae, villosae. *Pedicellus* 7 mm. longus. *Calyx* 4 mm. longus ; lobi falcati, villosi.

Oudtshoorn Division : In stony places at summit of the Zwartberg Pass, December, *Bolus* 11465.

A small-branched villous shrub. *Leaflets* 1·2 cm. long, mucronate at the apex, with strongly revolute margins, villous. *Bracts* 6 mm. long, broadly ovate, acuminate, villous. *Pedicels* 7 mm. long. *Calyx* 4 mm. long ; lobes broadly falcate.

11. **C. sessiliflora** (E. Mey. Com., p. 4).

Young branches and leaves densely villous, at length becoming glabrous. *Leaflets* 1·25 cm. long, linear, with strongly revolute margins, subsessile. *Bracts* 6 mm. long, broadly ovate, acuminate. *Flowers* ciliate. *Calyx* softly villous ; lobes falcate.—"*Flora Capensis,*" *II*, 8.

Caledon Division : Genadendal, December, *Schlechter* 9826.

12. **C. montana,** sp. nov.

Rami juniores sericei. *Foliola* 1·25–2·5 cm. longa, 2 mm. lata, linearia, basi cordata, marginibus revolutis. *Bractae* 4–6 mm. longae, ovatae, glabrae. *Calyx* sericeous, 8 mm. longus ; lobus infernus ceteris major.

Tulbagh Division : Sneeuwgat Valley, Great Winterhoek, November, *Phillips* 1693.

Var. **glabra.** Calycis glabris differt.

Ceres Division : Matroosberg, December, *Phillips* 1943.

Young branches and leaves silky, at length becoming glabrous. *Leaflets* 1·25–2·5 cm. long, 2 mm. broad, linear, cordate at the base, with revolute margins. Flowers subsessile. *Bracts* 4–6 mm. long, broadly ovate, glabrous, longer than the pedicel. *Calyx* 8 mm. long, densely silky ; the lower segment largest and broadest ; the middle segments shortest, subacute, broadly oblong ciliate.

Var. *glabra* differs in having a glabrous calyx.

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Bothalia.

A RECORD OF

CONTRIBUTIONS

FROM THE

NATIONAL HERBARIUM

UNION OF SOUTH AFRICA

PRETORIA

Smithsonian Institution
SEP 19 1924
National Museum

EDITED BY

I. B. POLE EVANS, C.M.G., M.A. (Cantab.), D.Sc. (Wales), F.L.S.

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Smithsonian Institution
SEP 19 1924
National Museum.

REVISION OF SOUTH AFRICAN SPECIES OF RHYNCHOSIA.

By EDMUND G. BAKER, F.L.S., Assistant Keeper, Department of Botany, Natural History Museum, South Kensington.

INTRODUCTION.

AT the request of Dr. I. B. Pole-Evans, C.M.G., and Dr. E. P. Phillips, I have examined the collection of the genus *Rhynchosia* from the National Herbarium at Pretoria, and I have also had an opportunity of seeing the plants of this genus from the Herbaria at Capetown and Durban, thanks to the courtesy of the Curators of these collections. I am also much indebted to the Director of the Botanical Museum at Upsala for allowing me to have the loan of Thunberg's types, and to Dr. Schinz for kindly sending me portions of types of many of his species.

Since the publication of the *Leguminosae* by Harvey in the "Flora Capensis," in 1861–62, a considerable amount of additional information has been acquired, and I am glad to take the opportunity offered to me of placing this on record. It is, perhaps, unnecessary to discuss in detail publications anterior to the "Flora Capensis." De Candolle, in the second volume of his "Prodromus," in 1825, described several species of *Rhynchosia* from South Africa, among these being *R. angustifolia* founded on *Glycine angustifolia* Jacq. and *R. rigidula* founded on Burchell No. 2587. The first of these is synonymous with, and must take precedence of, *R. uniflora*, Harvey, the second is evidently closely allied to *R. Totta*, D.C., but there is a mistake in the Burchell number, and I am unable to find it in the Kew Herbarium. Perhaps the other most important publications anterior to the "Flora" are E. Meyer's "Commentorium de Plantis Africae australioris" and Ecklon and Zeyher's "Enumeration." Subsequent to the "Flora" a good many species have been described, and a few preliminary notes on some of these novelties may not be out of place. In the "Journal of Botany," Vol. XVI, 131 (1878), Mr. Spencer Moore described *R. clivorum* from near Pilgrims Rest. It has been subsequently found in Gazaland by C. F. M. Swynnerton. It is a curious species with erect stem, showy flowers, and with the upper calycine lobes shorter than the lowest.

In 1888 Dr. Schinz described, in "Verhand. Bot. Brand.," Vol. XXX, two species, *R. hirsuta*, rom Olukonda in Amboland, and *R. longiflora* rom Great Namaqualand, the latter being allied to *R. Totta*, D.C., but with much finer flowers, and in 1894 the same author described in "Bull. Herb. Boiss.," Vol. II, *R. Woodii*, from Natal, an ally of *R. Orthodanum*, Benth. Dr. Harms in 1899, in Engler's "Bot. Jahrb.," Vol. XXVI, described *R. komatiensis* from between Spitzkop and the Komati River, and *R. longipes*, founded on Wilms No. 395, from Lydenberg. I have compared the latter with the type of *R. crassifolia*, Benth., and do not consider it specifically distinct. In 1897, in the "Journal of Botany," Dr. Schlechter described the very distinct *R. monophylla*, and in the same journal, in the same year, Messrs. Wood and Evans described the equally distinct *R. ovata*. In 1905 Dr. Schlechter, in "Ann. Nat. Hoffmus. Wien," described three species, *R. chrysantha*, *R. Harmsiana*, and *R. Pentheri*. In 1907, in the "Vierteljahrschrift Nat. Ges. Zurich," Dr. Schinz described *R. cinnamomea*, *R. congestiflora*, *R. elegantissima*, *R. Fleckii*, *R. namaensis*, and *R. Rehmanni*, and in 1910 the same author, in the same publication, described the very distinct *R. spectabilis.* I am doubtful whether *R. cinnamomea* is distinct from *Dolicholus venulosus*, Hiern. (*R. venulosus*, K. Schum.), and I think *R. Rehmanni* is synonymous with *Fagelia bituminosa*, D.C. In 1906 Dr. Bolus, in " Trans. S. Afr. Phil. Soc.," XVI, 383, described the curious and aberrant *R. pauciflora.* I hardly think *R. uncinata*, Schlechter, from Packhuis Berg, is separable from *R. bullata*, Benth. In 1913, in " Bull. Soc. Bot. Fr.," LX, 461, Gandoger quite correctly segregated the *R. memnonia* of Harvey, calling the silvery plant with a rigid stem *R. albissima.*

Several plants have been issued with ms. names to which I must allude. Wilms No. 375 I would place as synonymous with *R. monophylla*, Schlechter; Wilms No. 387 appears to me to be a form with more angled leaves than usual of *R. sigmodes*, Benth. I have retained *R. graciliflora*, Harms, founded on Wilms No. 367, as a variety of *R. Totta*, D.C.; it differs in the shape of the leaflets from the typical form. Quite recently in the " Kew Bulletin " Mr. Burtt-Davy described *R. unifoliolata.* It is also a close ally of the true *R. Totta,* D.C., but is sometimes unifoliolate, and has shorter petioles. A little later in the same publication he also describes *R. confusa. R. Burkei, R. Harmsiana* Schl., var. *Burchellii,* and *R. Pentheri* Schl., var. *Hutchinsoniana.* With *R. Burkei* and *R. Pentheri*, Schl., var. *Hutchinsoniana,* he has associated my name.

NOTES ON TAXONOMY.

Harvey, in the " Flora Capensis," arranges the species of *Rhynchosia* then known to him in four sections: (i) **Chrysoscias**; (ii) **Polytropia**; (iii) **Copisma**; and (iv) **Orthodanum.** The first of these is well marked by the character of the inflorescence, which is generally umbellate, more rarely the flowers are solitary. The leaflets are narrow and either tomentose or villose below. This section I retain as originally delimited.

The section **Polytropia** is at once recognized by having pinnate or bipinnate leaves. But there is a difficulty with regard to the sections **Copisma** and **Orthodanum.** Certain plants in these sections are very distinct from one another; take, for instance, *R. adenodes*, Ecklon and Zeyher, and *R. minima*, D.C., with a distinctly voluble stem, which is the main character of Harvey's **Copisma,** and **R. Orthodanum,** Benth., which is erect, rigid, and suffruticose, and which is the type of Harvey's section **Orthodanum.** But there are certain intermediate plants which are difficult to place. Take, for instance, *R. viscidula,* Steud.: the plant from Little Namaqualand has a somewhat rigid stem and cannot be correctly placed in **Copisma.** I have, therefore, thought it advisable to unite the sections **Copisma** and **Orthodanum,** and am calling this section **Eurhynchosia.**

I have introduced the section **Cyanospermum**, Benth., for *R. cyanosperma,* Benth. It may be easily recognized by the robust voluble stem, the racemose inflorescence, the broad calycine segments, which are densely matted on the back with a grey tomentum, and the dark blue seeds. I am also introducing the section **Arcyphyllum** Torrey and Gray for two species which occur south of the Tropic. The stem in this section is voluble, the flowers are in dense, oblong, sessile, subsessile, or pedunculate clusters, and with the calycine teeth much narrower than in section **Cyanospermum.**

There are one or two anomalous species which require consideration. One of these is *R. pauciflora*, Bolus, with solitary pedicellate flowers and broad calycine lobes. It comes from the Transvaal and Swaziland. *R. ficifolia*, Benth., I am excluding from the genus. It is a *Pueraria.* Some species from Great Namaqualand such as *E. namaensis*, Schinz, I have not included, as it is recorded from Rehoboth, which is just north of the Tropic.

DESCRIPTION OF SPECIES.

SECT. I.—CYANOSPERMUM, Benth., in Benth. and Hook " Gen. Plant " (1865), 543.

Stem voluble, robust. Inflorescence racemose. Calyx as long as or slightly longer than the corolla, segments rather broad, subequal in length, uppermost connate. Seeds dark blue.

1 **R. cyanospermum,** Benth., *ex* Baker in Oliver, "Fl. Trop. Afr.," II, 218.

Stems voluble, robust, densely grey or ferruginous-pubescent when young. *Stipules* ovate, pubescent. *Leaves* trifoliolate; leaflets coriaceous; terminal leaflet ovate or suborbicular, below densely grey-tomentose; lateral leaflets unequalsided. *Flowers* rather large, in racemes. *Bracts* ovate, deciduous. *Calyx* 18–20 mm. long or rather more, densely matted on the back with grey tomentum; tube short; lobes uppermost, somewhat spathulate, the others blunt, 4–5 mm. broad. *Corolla* about as long as the calyx; standard obovate; carina boat-shaped, base unguiculate. *Pod* oblong, equalling the calyx; seeds dark blue.

NATAL.—Lower Illovo, *Wood* No. 6507, Natal Herb.

SECT. II.—ARCYPHYLLUM, Torr. and Gray, "Fl. North. America" (1838), 284.

Stem voluble. *Flowers* in dense oblong, sessile, or subsessile, or shortly-stalked clusters. *Calyx teeth* narrow, sometimes more or less connate, slightly shorter than, or same length as, the corolla. *Seeds* brown or black, not blue.

+ *Terminal leaflet ovate, subrotund, acuminate.*

2. **R. densiflora,** D.C., "Prod.," II, 386; Baker in Hooker, "Fl. Brit. India," II, 226; Baker *ex* Oliver, "Fl. Trop. Afr.," II, 222.

Glycine densiflora, Roth., nov. sp. 348; *Desmodium punctatum,* D.C., "Prod.," II, 338.

Stem slender, firm-herbaceous, voluble, grey pilose. *Stipules* lanceolate. *Leaves* trifoliolate, papyraceous; terminal leaflets broadly ovate acuminate; petiolules of terminal leaflets 10–18 mm. long; lateral leaflets unequalsided. *Flowers* in dense, oblong, subsessile clusters. *Bracts* lanceolate. *Calyx* 12–15 mm. long, teeth narrow, subequal, two uppermost more or less connate; tube short. *Standard* glabrous, auriculate, about 15 mm. long; wings unguiculate, distinctly shorter than the carina; carina boat-shaped, obtuse. *Pod* 12–14 mm. long, rather narrowed at both ends, grey pubescent.

NATAL.—*Gerrard* No. 1737; Camperdown Div., *Wood* No. 11706.

TRANSVAAL.—Makapansberg, *Rehmann* No. 5548; Potgietersrust, *Leendertz* No. 146, 1216; Barberton, *Thorncroft* No. H. 11274; Pienaars River, *Leendertz* No. 783.

+ + *Terminal leaflet rhombeo-ovate, generally obtuse.*

3. **R. connata,** sp. nov.

Caulis volubilis, pubescens, longitudinaliter striatus. *Stipulae* ovatae, acutae; stipellis ad basin petiolulorum minutis linearibus. *Folia* trifoliolata; foliolis terminalibus rhombeo-ovatis apice obtusis vel rarius subacutis, 3–4 cm. longis et latis; lateralibus inaequilateralibus, petiolo communi 4–5 cm. longo praedita; foliolis terminalibus petiolulis 8–10 mm. longis suffultis. *Flores* flavi in capitula densa disposita; capitulis breviter pedunculatis. *Calycis lobis* 2 superioribus plus minus connatis, reliquiis lineari-lanceolatis. *Vexillum* apice emarginatum; alae oblongae basi unguiculatae; carina naviculariformis apice obtusa. *Ovarium* pilis vestitum; stylo gracili. *Legumen* ignotum.

NATAL.—Camperdown, *Miss Franks* No. 1250.

Ally of *R. Stuhlmanni,* Harms in Engler's "Bot. Jahrb.," XXVI, 308.

SECT. III.—CHRYSOSCIAS, Benth., *ex* Harvey and Sonder, "Fl. Cap.," II, 249.

Stem voluble. Leaves pinnately trifoliolate. Stipules broad. Flowers in axillary umbels or solitary.

Series 1.—*Calyx large,* 15–18 *mm. long. Flowers in umbels rarely solitary. Underside of leaf fulvous-villose.*

4. **R. chrysoscias,** Benth., *ex* Harvey and Sonder, "Fl. Cap.," II, 249; Oliver in "Bot. Mag.," t. 5913.

Chrysoscias grandiflora, E. Mey., "Comm.," 139; *Glycine erecta,* Thunbg., "Fl. Cap.," 592; *Cylista lancifolia,* Ecklon and Zeyher, Herb. No. 1690.

A climbing suffrutex with voluble stem, and the younger parts clothed with tawny or yellowish hairs. *Stipules* broad. *Leaves* pinnately trifoliolate, thinly pubescent above, tomentose or villose below; terminal leaflets oblong-lanceolate with revolute margins 3·5–5 cm. long, 8–15 mm. broad; petioles 5–15 mm. long. *Peduncles* bearing 3–4 flowers at the summit. *Calyx* 15–18 mm. long; tube short; segments lanceolate; the two upper somewhat connate at the base. *Pod* not much longer than the calyx, pilose.

CAPE.—Districts George and Knysna, Plettensbergs Bay, *Zeyher* No. 1690.

Chrysoscias media, E. Mey., from Kaymans Gat, is a close ally.

Series 2.—*Calyx silky-silvery,* 15–20 *mm. long, upper lobes connate to or beyond the middle. Underside of leaf white tomentose.*

5. **R. leucoscias** Benth., *ex* Harvey, l.c. II, 249.

Cylista argentea, Ecklon and Zeyher, 1688; *Cylista angustifolia,* E. Mey., in "Linnaea," VII, 171; *Chrysoscias calycina,* E. Mey., "Comm.," 140.

Suffruticose voluble, albo-villose. *Stipules* broadly oblong, obtuse or subacute. *Leaves* trifoliolate, very shortly petiolate; terminal leaflets with revolute margins, oblong-lanceolate or linear, white tomentose below, 4–5·5 cm. long, 5–7 mm. broad in the middle; common petioles 2–4 mm. long. *Peduncles* umbelliferous. *Calyx* silky-silvery; tube very short; segments lanceolate, leafy, silky and silvery. *Corolla* two uppermost segments connate to or beyond the middle, glabrous; standard 14–16 mm. long. *Pod* not seen.

CAPE.—Van Stadensberg, *Ecklon and Zeyher.*

Var. **angustifolia,** Harvey, l.c. 249.

Leaflets narrower, narrow-linear. *Flowers* sub-solitary.

CAPE.—Caledon Div., River Zondereinde, *Zeyher* No. 2410.

Distinguished from *R. chrysoscias,* Benth., by its much whiter and woolly tomentum and the connate upper calyx lobes.

Series 3.—*Calyx cano-pubescent,* 6–9 *mm. long; upper lobes connate to middle. Umbels* 4–8-flowered.

6. **R. microscias,** Benth., *ex* Harvey, l.c. 249

Chrysoscias parviflora, E. Mey., "Comm.," 139.

Suffruticose voluble, silky-canescent. *Stipules* ovate-lanceolate, 4–6 mm. long. *Leaves* trifoliolate, on very short petioles; terminal leaflets linear-lanceolate or linear, 3–4 cm. long, 4–7 mm. broad, canescent and tomentulose beneath; common petioles 2–4 mm. long; lateral leaflets slightly unequalsided at the base. *Peduncles* bearing umbels of 4–8 flowers. *Flowers* much smaller than in *R leucoscias,* Benth. *Calyx tube* very short; segments lanceolate, cano-pubescent, shorter than the standard. *Standard* 10–12 mm. long, glabrous; carina glabrous, obtuse. *Pod* pilose, 15–20 mm. long, mucronate.

CAPE.—Mountain sides, near George, *Drège*; Knysna, *Tyson, Bowie*; Humansdorp Div., Zitzikama, *E. Galpin* No. 3989.

Known at once from the preceding by the smaller flowers and shorter indumentum.

Series 4.—*Flowers solitary.*

7. **R. angustifolia,** D.C., "Prod.," II, 388.

R. uniflora, Harvey, l.c. II, 249; *Glycine angustifolia,* Jacq., "Hort. Schoenb.," II, t. 231; *Cylista angustifolia,* Ecklon and Zeyher No. 1689.

Stem voluble, silky-canescent. *Stipules* ovate, subacute. *Leaves* trifoliolate, very shortly petiolate; leaflets lanceolate or linear, with revolute margins, whitish or tomentose below; terminal leaflets 15–25 mm. long and about 2–3 mm. broad; terminal petiolule silky canescent, 2–3 mm. long; lateral leaflets shorter than terminal. *Flowers* solitary, axillary, on short pedicels. *Calyx* 13–15 mm. long, grey-villous ; tube very short ; segments lanceolate, not much shorter than the petals ; two uppermost somewhat connate. *Standard* glabrous, 13–15 mm. long. *Pod* not seen.

Cape.—Purpas Valley and Zwarteberg, near Caledon, *Ecklon* No. 1689.

This plant is easily recognized by the voluble stem, the very narrow trifoliolate leaves, and the solitary axillary flowers with a silky villous calyx. It must take De Candolle's earlier name of *R. angustifolia.*

SECT. IV.—POLYTROPIA, Harvey and Sonder, "Fl. Cap.," II, 248.

Stem prostrate or trailing. Leaves pinnate or bipinnate, plurijugate. Flowers racemose.

Series 1.—*Leaves pinnately decompound.*

8. **R. ferulaefolia,** Benth., *ex* Harvey, l.c.

Polytropia ferulaefolia, "Presl. Symb.," t. 13 ; *Psoralea prostrata,* "Linn.," sp. pl. 762 ; *Galega pinnata,* Thunberg, "Fl. Cap.," 602 ; *Polytropia umbellata,* Ecklon and Zeyher No. 1627.

Prostrate, nearly glabrous. *Stipules* rather short. *Leaves* pedately bipinnate, paucijugate or supra-decompound ; leaflets sessile, narrow-lanceolate or linear, acute at each end, varying from about 5–20 mm. long ; common petiole generally 2–4 cm. long, glabrous or nearly so. *Peduncles* longer than the leaves, bearing a cluster of 5–12 flowers towards the apex ; pedicels 1–3 mm. long. *Flowers* viscoso-pubescent. *Calyx* with lowest segment conspicuously narrower than the rest. *Standard* 7–9 mm. long. *Pod* 12–16 mm. long, subfalcate or nearly straight, nearly glabrous.

Cape.—Common on the Cape Flats and in several parts of the western districts. There is a specimen of this in Herb. Sloane, from the Cape, gathered by Oldenland. This will certainly be one of the earliest records for this species.

Series 2.—*Leaves simply pinnate.*

9. **R. pinnata,** Harvey, "Thes.," t. 79 ; Harvey in Harvey and Sonder, l.c. 250.

Polytropia pinnata, Ecklon and Zeyher No. 1628.

Whole plant minutely downy, prostrate. *Stipules* ovate, striate, deflexed. *Leaves* simply pinnate, bi- to tri-jugate ; terminal leaflet rhomboid-ovate or obovate, 6–12 mm. long ; lateral leaflets generally elliptic-oblong, impresso-punctate. *Peduncles* elongate, 5–6-flowered near the summit. *Calyx* pubescent, 6–7 mm. long ; lowest segment narrower than the others, shorter than the petals. *Standard* yellow, 6–8 mm. long, glabrous or nearly so ; carina about same length as the standard. *Pod* not seen, stated by Harvey to be the same as in *R. ferulaefolia,* Benth.

Cape.—Saldanha Bay, *Ecklon and Zeyher* No. 1628.

SECT. V.—EURHYNCHOSIA (incl. *Copisma* and *Orthodanum*).

Stem voluble or rigid. *Leaves* trifoliolate or rarely unifoliolate. *Inflorescence* generally racemose, but flowers sometimes solitary or subsolitary. *Calyx* generally shorter than the corolla ; segments generally lanceolate. *Seeds* brown, or reddish-brown, or black, not blue (in those species in which the seeds are known).

CLAVIS OF SPECIES.

A.—Stems voluble or subvoluble.
(*a*) Bracts persistent.
—Leaves trifoliolate.
Glabrous or nearly so.................................. *R. rotundifolia,* Walp.
Hairy.. *R. grandifolia,* Steud.
— —Leaves unifoliolate.................................. *R. simplicifolia,* E. Mey.

(*b*) Bracts caducous, rarely subpersistent.

× Terminal leaflets broad.

+ Flowers fasciculate. Leaves uni- or tri-foliolate; leaflets orbicular-ovate or ovate.......... *R. monophylla*, Schl.

+ + Peduncles short, generally shorter than the leaves, racemose, laxly few-flowered.

— Flowers small, 5–10 mm. long.

Terminal leaflets orbicular-rhomboid, obtuse, softly pubescent or velvety.......... *R. Harveyi.* (*R. secunda*, Harvey.)

Terminal leaflets rhombeo-ovate. Leaves fulvous.... *R. secunda* (Thunberg).

Terminal leaflets obovate, nearly glabrous.......... *R. Burkei*, Burtt-Davy and Bak. fil.

Terminal leaflets obovate. Leaves grey pubescent...... *R. Fleckii*, Schinz.

Terminal leaflets elliptic-oblong or subrhomboid...... *R. confusa*, Burtt-Davy.

— — Flowers larger, 12–14 mm. long. Terminal leaflets broadly rhomboid.......... *R. quadrata*, Harvey.

+ + + Peduncles long, generally longer than the leaves, laxly few-flowered.

÷ Standard glabrous.

Terminal leaflets ovate or broadly ovate, 3–4·5 cm. long, 2·5–4 cm. broad. Stem cinereous pubescent........ *R. reptabunda*, N.E.Br.

Terminal leaflets ovate or suborbicular-ovate, 2–3 cm. long, 2·5–4 cm. broad. Stem cinereous pubescent......... *R. Jacottetii*, Schinz.

Terminal leaflets broadly ovate or suborbicular. Stems markedly pilose.......... *R. ovata*, Wood & Evans.

Terminal leaflets ovate or rhombeo-ovate. Stems puberulous. *R. Harmsiana*, Schlechter.

Terminal leaflets rigid, subrhomboid or elliptic-oblong. Stems hispido-pubescent or villous.......... *R. nervosa*, Benth.

Terminal leaflets thin, ovate-rhomboid. Stem thinly pubescent. Upper calycine segments short and broad...... *R. caribaea*, D.C. (*R. gibba*, E. Mey).

Terminal leaflets triangular-ovate. Stem pubescent........ *R. Dieterlenae*, Bak. fil.

÷ ÷ Standard pubescent.

Terminal leaflets broadly ovate-suborbicular, rigid hispido-pubescent. Stem patently hairy.......... *R. hirsuta*, Ecklon and Zeyher.

Terminal leaflets broadly ovate, rather thick, canotomentose below. Stem tomentose.......... *R. argentea*, Harvey.

+ + + + Peduncles longer than the leaves, generally laxly many-flowered, occasionally subdense towards the apices.

Flowers small, 6–9 mm. long. Terminal leaflets rhombeo-ovate or rhombeo-obovate.......... *R. minima*, L.

Flowers larger, 10–15 mm. long.

Terminal leaflets ovate-triangular, pubescent........ *R. stenodon*, Bak. fil.

Terminal leaflets rhombeo-ovate. Standard pubescent. *R. memnonia*, D.C., var. *prostrata*, Harvey.

Terminal leaflets thin, rhombeo-triangular. Standard glabrous.......... *R. Harmsiana*, Schl., var. *grandifolia*, Bak. fil.

Terminal leaflets thick, velvety, elliptic-ovate. Standard pubescent.......... *R. crassifolia*, Benth. (*R. longipes*, Harms.).

Terminal leaflets suborbicular or ovate. Standard glabrous. Calyx glandular.......... *R. Pentheri*, Schlechter.

Terminal leaflets rhombeo-ovate, copiously dotted below. Standard glandular.......... *R. adenodes*, Ecklon and Zeyher.

+ + + + + Peduncles longer than the leaves. Racemes dense.

Terminal leaflets suborbicular, dotted below.......... *R. adenodes*, Ecklon and Zeyher, var. *Cooperi*, Bak. fil.

Terminal leaflets large, cordate-ovate or suborbicular, rugose, thick, velvety.......... *R. sigmodes*, Benth.

Terminal leaflets ovate-suborbicular.......... *R. chrysantha*, Schlechter.

× × Terminal leaflets narrower.

Leaflets elliptic-oblong or oblong. Peduncles 1–2-flowered, shorter than the leaves. Stem prostrate or voluble.... *R. puberula*, Harvey.

Leaflets in typical form, ovate-oblong or elliptical, in forma *angustifolia*, lanceolate-oblong. Peduncles 1–3-flowered *R. Totta,* D.C.

Leaflets narrow-lanceolate. Peduncles 2-flowered. Flowers larger than in *R. Totta,* D.C. .... *R. longiflora,* Schinz.

Leaflets elliptical. Racemes very lax, few-flowered. Stem voluble. Indumentum cinnamon coloured .... *R. venulosa,* K. Schum. (*R. cinnamomea,* Schinz.)

Leaflets lanceolate, more or less sericeous. Raceme very lax. Stem voluble .... *R. elegantissima,* Schinz.

Leaflets oblong-lanceolate or ovate. Peduncles 1–6-flowered near the summit. Stem voluble, glabrous, or minutely downy .... *R. glandulosa,* D.C.

Leaflets linear or linear-lanceolate. Peduncles generally one-flowered .... *R. rigidula,* D.C.

B.—Stem rigid or subrigid.

+Peduncles generally shorter than the leaves, few-flowered.

Silky villous or glabrous. Leaflets elliptic-oblong or lanceolate-oblong .... *R. Orthodanum,* Benth.

Canotomentose. Terminal leaflets broader than long ..... *R. spectabilis,* Schinz.

Cinnamon-coloured tomentum. Terminal leaflets oval or oval-suborbicular .... *R. Rudolfi,* Harms.

Pubescent. Terminal leaflets ovate or orbicular-ovate ..... *R. komatiensis,* Harms.

Velvety when young. Terminal leaflets ovate-lanceolate. Flowers large .... *R. clivorum,* S. Moore.

Silky silvery. Leaflets broadly ovate or cordate-ovate. Flowers 16–18 mm. long .... *R. nitens,* Benth.

Silky silvery. Leaflets larger, oblong-obovate. Flowers 20–23 mm. long .... *R. Galpini* Bak. fil.

++Flower pedicellate.

Terminal leaflets rhombeo-ovate or suborbicular-ovate. Flowers 17–19 mm. long .... *R. Bakeri,* Schinz.

+++Peduncles scarcely longer than the leaves, 1–2-flowered.

Shrubby, erect, viscidly hairy and resin-dotted. Flowers 13–16 mm. long .... *R. bullata,* Benth. (*R. uncinata,* Schltr.)

++++Peduncles about as long as the leaves, or slightly longer, several to many flowered. Flowers 8–16 mm. long.

Hairy and somewhat silvery. Terminal leaflets elliptical. Flowers 14–16 mm. long .... *R. angulosa,* Schinz.

Pubescent. Terminal leaflets oblong-obovate. Flowers 11–13 mm. long .... *R. Woodii,* Schinz.

Canotomentose. Terminal leaflets obovate. Flowers 8–12 mm. long .... *R. albissima,* Gandoger.

Pubescent. Terminal leaflets rhombeo-ovate. Flowers 10–11 mm. long .... *R. Pegleri,* Bak. fil.

+++++Peduncles longer than the leaves, always one-flowered.

Leaflets rigid, narrow, margins distinctly revolute .... *R. pauciflora,* Bolus.

++++++Peduncles longer than the leaves, few-flowered glandular plants.

Lateral leaflets obtuse .... *R. viscidula,* Steud.

Lateral leaflets ovate-lanceolate, acute .... *R. Schlechteri,* Bak. fil.

A.—STEM VOLUBLE. BRACTS PERSISTENT.

Series 1.—Leaves trifoliolate, leaflets small, orbicular or ovate.

10. **R. rotundifolia,** Walp. Rep. I, 787; Harvey, l.c. 250.

Copisma rotundifolium, E. Mey., "Comm.," 137.

Prostrate. Stem flexuous, angled. *Stipules* small, striate, about 4 mm. long. *Leaves* trifoliolate, on rather long filiform petioles; leaflets ovate or orbicular, netted-veined and resin-dotted, glabrous or nearly so; terminal leaflets 10–13 mm. long, 9–11 mm. broad; common petiole 3–4 cm. long. *Peduncles* elongate, densely racemose near the summit. *Flowers* rather large, 12–14 mm. long. *Bracts* broadly ovate, persistent. *Calyx* 5–6 mm. long; lowest segment longest, subglabrous. *Corolla* glabrous; standard broadly ovate or orbicular; keel broadly falcate. *Pod* not seen.

Cape.—Pondoland: Omsamcaba, *Drège*.

Known by the broadly ovate persistent bracts, the trifoliolate leaves on rather long filiform petioles.

Series 2.—Leaves trifoliolate or unifoliolate; leaflets rather large, pubescent.

+ *Leaves trifoliolate.*

11. **R. grandifolia,** Steud., "Nom., ed. 2, II, 454; Harvey, l.c. 250.

Copisma grandifolium, E. Mey., "Comm.," 138.

Procumbent robust hirsuto-pubescent. *Stipules* broadly cordate. *Leaves* trifoliolate, subsessile or petiole very short; terminal leaflets ovato-subrotund, hispido-pubescent, 5–6 mm. long, 4–5·5 cm. broad; lateral leaflets unequalsided. *Peduncles* elongate, longer than the leaves, closely spicate-racemose beyond the middle. *Bracts* ovate-oblong, acute, persistent, hairy. *Calyx segments* lanceolate; uppermost semiconnate; lowest subulate. *Corolla* glabrous; standard striped on the back; wings shorter than the standard; keel boat-shaped. *Young pod* hirsute.

Cape.—Near Kat River, *Drège*; at foot of Winterberg, *Mrs. Barber*; Kingwilliamstown, *Flanagan* No. 2137; Kreil's Country, *Bowker*.

Known by the elongate peduncle spicate-racemose beyond the middle, the rather showy flowers, and persistent ovate-oblong acute bracts.

+ + *Leaves unifoliolate.*

12. **R. simplicifolia,** E. Mey., "Comm.," 138; Harvey, l.c. 251.

Described as being very closely allied to *R. grandifolia*, Walp., but the leaves are simple. *Stipules* cordate-ovate, acuminate. *Bracts* ovate-lanceolate.

Transkei.—Umtata, *Drège*.

Only known to me from E. Meyer's description. It is possibly a unifoliolate form of *R. grandifolia*, Walp.

B.—STEM VOLUBLE. BRACTS CADUCOUS. FLOWERS FASCICULATE.

Series 3. Leaflets unifoliolate or trifoliolate, suborbicular, or ovate, or ovate-oblong, puberulous. Flowers 12–14 mm. long.

13. **R. monophylla,** Schlechter in "Journ. Bot." (1897) 279.

Stem voluble, branches decumbent, filiform, elongate. *Leaves* simple or trifoliolate, suborbicular, or ovate, or ovate-oblong, reticulate nerved, 2·5–4 cm. long, 2–3 cm. broad. *Flowers* in axils of leaves, fasciculate. *Bracts* deciduous. *Calyx* ± 6 mm. long; segments linear, acute. *Standard* suborbicular-rhomboid, ± 11 mm. long, 9 mm. broad; wings unguiculate; keel obtuse, apex incurved, glabrous. *Ovary* villous. *Pod* obliquely ovate-elliptical, very compressed, base acute, apex acuminate, ± 11 mm. long, 5–6 mm. broad.

Transvaal.—Near Barberton, *E. E. Galpin* No. 489; Pretoria, *Rehmann* No. 4582; *Rogers* No. 18942; *A. O. D. Mogg*, in Govt. Herb., No. 10556; near Witbank Station, *Gilfillan* No. 7184; Lydenberg, *Wilms* No. 375; near Barberton, *Bolus* Nos. 1142 and 7603.

Wilms No. 375 was issued with a ms. name, but it is not specifically distinct from the above.

Occurs also in Gazaland.

Var. nov. **Eylesii,** Bak. fil.

Caulis procumbens, pubescens. *Stipulae* latae, ovato-lanceolatae, 5–7 mm. longae. *Folia* saepissime trifoliolata, suprema unifoliolata, foliolis terminalibus late ovatis vel suborbiculari-ovatis, 2·5–4 cm. longis, 2·5–3 cm. latis; petiolulis foliolorum terminalium 8·10 mm. longis; foliolis lateralibus inaequilateralibus. *Flores* fasciculati. *Vexillum* flavum, ± 12 mm. longum. *Legumen* immaturum pilis vestitum.

Rhodesia.—Salisbury, *F. Eyles* No. 2094. Alt. 4900 ft.

This is a procumbent herb with rather broad stipules. It differs principally from the type in the leaves being mostly trifoliolate. The standard is yellow and the wings bright red. The calyx is ± 13 mm. long (total length), the lowest segment narrow and much longer than the others. Calyx tube, ± 3 mm.

C.—STEM VOLUBLE OR SUBVOLUBLE. BRACTS CADUCOUS, RARELY SUBPERSISTENT. LEAFLETS BROAD. FLOWERS RACEMOSE.

Series 4.—*Leaflets small. Peduncles nearly as long as or slightly longer than the leaves. Flowers small, in unilateral racemes.*

+ *Leaflets softly pubescent or velvety. Stipules broadly ovate.*

14. **R. Harveyi.** (*R. secunda* Harvey, l.c. ii. 251.)

Prostrate softly pubescent or velvety. *Branches* flexuous. *Leaves* trifoliolate, petiolate; terminal leaflets orbicular-rhomboid, obtuse, 10–15 mm. long, 12–17 mm. broad; lateral leaflets unequalsided. *Peduncles* shorter or scarcely longer than the leaves, laxly 2–4-flowered. *Calyx* 6–7 mm. long; segments longer than the tube, shorter than the glabrous standard. *Standard* ± 9 mm. long. *Keel* ± 9 mm. long. *Pod* 15–18 mm. long, narrowed towards the base, pubescent.

Cape.—Smaldeel, *Zeyher* No. 514; near Grahamstown, *P. MacOwan* No. 160.

Flanagan No. 164 from Komgha is a form of this species.

+ + *Leaflets fulvous, resin-dotted below.*

15. **R. secunda** (*Glycine secunda*, Thunberg, "Prod. Fl. Cap.," 131).

Stem herbaceous, filiform, pubescent. *Stipules* narrower than in the preceding species, lanceolate, longitudinally striate. *Leaves* trifoliolate, petiolate; terminal leaflets rhombeo-ovate, 10–15 mm. long, and nearly the same breadth, rounded at the apex; petiolules 2–3 mm. long; lateral leaflets unequalsided, sessile or subsessile, all resin-dotted below; petioles pubescent, 8–10 mm. long. *Flowers* small, in 5–10-flowered secund racemes, which are often 3–4 cm. long. *Pedicels* very short. *Calyx* 6–7 mm. long, hairy, the lowest segment longer than the rest. *Standard* 6–8 mm. long, glabrous; keel about the same length. *Pod* not seen.

Cape.—In campis graminosis, *Thunberg,* Herb. Thunberg.

This is a rare plant, the only specimen I have seen being in Herb. Thunberg.

Series 5.—*Leaves trifoliolate, terminal leaflets broadly obovate. Peduncles short,* 5–7-*flowered.*

16. **R. Burkei,** Burtt-Davy and Bak. fil. in "Kew Bull.," 1921, 193.

R. adenodes, Ecklon and Zeyher, var. ? *robusta,* Harvey, l.c.

Stems prostrate, robust, longitudinally striate, pubescent. *Stipules* lanceolate. *Leaves* trifoliolate, petiolate; terminal leaflets broadly obovate, 20–25 mm. long, 23–28 mm. broad; terminal petiolules 6–8 mm. long, on both sides except the nerves nearly glabrous; lateral leaflets unequalsided, sessile; common petiole 15–25 mm. long. *Peduncles* laxly 5–7-flowered, generally 25–30 mm. long. *Flowers* small, 7–8 mm. long. *Calyx* pubescent, ± 4 mm. long. *Standard* 6–7 mm. long. *Pod* pubescent, about 12 mm. long.

Orange Free State.—Thaba 'Nchu, *Zeyher* No. 280; *Burke* in Herb., Kew.

This is quite distinct from *R. adenodes,* Ecklon and Zeyher. It has broad, obovate terminal leaflets and a short inflorescense of quite small flowers. It does not seem to be common.

Series 6.—*Leaves trifoliolate, terminal leaflets ovate or obovate. Racemes short, few-flowered.*

+ *Terminal leaflets obovate,* 20–25 *mm. broad.*

17. **R. Fleckii,** Schinz in "Vierteljahrschrift Nat. Ges. Zurich," LII, 428 (1907).

Stem slender, filiform, pubescent. *Stipules* small, linear-lanceolate, pubescent. *Leaves* trifoliolate, petiolate, grey pubescent; terminal leaflets obovate, about 25 mm. long and 20–25 mm. broad; terminal petiolules pubescent, 8–10 mm. long; lateral leaflets somewhat unequalsided, also about 25 mm. long, petiolules much shorter. *Racemes* short, few-flowered. *Calyx* grey pubescent, segments narrow-lanceolate, shorter than the corolla. *Standard* 7–9 mm. long; keel boat-shaped, apex blunt. *Pod* pubescent, mucronate, 23–25 mm. long, 8–9 mm. broad at the broadest point.

KALAHARI REGION.—Uschi, *Fleck* No. 693.

Noticeable on account of the slender stem, small stipules, trifoliolate leaves covered with grey pubescence, obovate terminal leaflets, and short few-flowered inflorescence. An ally of *R. confusa*, Burtt-Davy.

++ *Terminal leaflets narrower*, 12–16 *mm. broad.*

18. **R. confusa,** Burtt-Davy, in "Kew Bull.," 1921, 192.

R. nervosa, Benth., var. *pauciflora*, Harvey, l.c.

Perennial prostrate herb, with puberulent stems. *Stipules* subulate. *Leaves* trifoliolate, cano-pubescent; terminal leaflets ovate or obovate, longer than broad, 13–20 mm. long, 12–16 mm. broad; petiolules about 5 mm. long; lateral leaflets unequalsided, common petioles tomentose, 5–10 mm. long. *Peduncles* slender, 2–4-flowered, shorter than the leaves or only slightly longer. *Pedicels* slender, 1–2 mm. long. *Flowers* about 8 mm. long. *Calyx lobes* lanceolate, acuminate, pubescent. *Standard* glabrous. *Pod* puberulous, about 2 cm. long and 7 mm. broad.

TRANSVAAL.—Magalies River, *Zeyher* No. 516; Aapjes River and Vaal River, *Zeyher* Nos. 508, 511.

ORANGE FREE STATE.—Kroonstad Dist., Rhenoster Kop, *Zeyher*; Bloemfontein, *Burtt-Davy* No. 11767.

BRITISH BECHUANALAND.—Kuruman Dist., *Burchell* Nos. 2298, 2457, 2548B; Vryburg Div., near Geluk, *Burtt-Davy* No. 11121.

This species is easily recognized by its trifoliolate cano-pubescent leaves and short 2–4-flowered inflorescence generally shorter than the leaves.

It also occurs in Rhodesia, Victoria Div., *Munro* No. 549.

Series 7.—*Flowers* 12–15 *mm. long in lax racemes. Terminal leaflets ovate, triangular, acute, or broadly rhomboid. Stem tomentulose.*

19. **R. quadrata,** Harvey, l.c. ii, 254.

Stem herbaceous, flexuous, thinly tomentulose. *Stipules* small, lanceolate. *Leaves* thin, trifoliolate, petiolate; leaflets broadly rhomboid-acute or subacuminate; terminal leaflets 20–35 mm. long, 20–38 mm. broad; terminal petiolule 5–8 mm. long, lateral leaflets unequalsided, common petioles 15–25 mm. long. *Racemes* shorter or a little longer than the leaf, 5–8-flowered. *Bracts* narrow, caducous. *Calyx* glandular, 14–15 mm. long; lowest lobe longest and nearly same length as carina. *Standard* glabrous or nearly so, 13–15 mm. long. *Ovary* glandular, biovulate. *Pod* substipitate, falcate, twice as long as calyx.

NATAL.—Port Natal, *T. Williamson, Peddie;* Durban, *Wood* No. 1656.

Easily recognized by its thin, rhomboid, acute leaflets, and glandular calyx and ovary.

Series 8.—*Leaves trifoliolate, leaflets ovate or broadly ovate. Peduncles longer than the leaves, towards the apex, laxly* 2–6-*flowered.*

+ *Terminal leaflets* 3–4·5 *cm. long*, 2·5–4·0 *cm. broad.*

20. **R. reptabunda,** N. E. Br. in "Kew Bull.," 1906, 103.

Stem herbaceous, creeping, pubescent or pilose. *Stipules* rather large, 7–11 mm. long. *Leaves* trifoliolate, petiolate ; leaflets ovate or broadly ovate, 3–4·5 cm. long, 2·5–4 cm. broad, on both sides pubescent ; common petiole 3–6 cm. long, puberulous and laxly pilose. *Peduncle* longer than the leaves, 5–17·5 cm. long, towards the apex laxly 2–6-flowered. *Bracts* lanceolate, 4–5 mm. long. *Pedicels* ± 3 mm. long. *Calyx* pubescent ; tube 3 mm. long, upper teeth 3–4 mm. long, lowest lanceolate-subulate, ± 7 mm. long. *Corolla* glabrous, yellow ; standard 8·5 mm. long, broadly oblong ; keel about the same length as the standard, obtuse. *Ovary* densely tomentose.

NATAL.—Near Charlestown, *Wood* No. 5734 ; Giant's Castle, *Wood* No. 10673.

Easily recognized by the trifoliolate pubescent leaves, and the long peduncle laxly 2–6-flowered towards the apex, and large stipules.

++ *Terminal leaflets smaller,* 2·5–3·0 *cm. long,* 28–40 *mm. broad.*

21. **R. Jacottetii,** Schinz. in Herb. Zurich.

Stem herbaceous, pubescent or pilose. *Stipules* conspicuous, oblong or ovate-oblong, hairy, 7–10 mm. long. *Leaves* trifoliolate, petiolate ; terminal leaflets broadly ovate or suborbicular-ovate, hairy, 2–3 cm. long, 2·5–4·0 cm. broad, generally broader than long ; terminal petiolules 4–5 mm. long, lateral leaflets unequalsided, broad, common petioles pilose, 2–3 cm. long. *Peduncles* longer than the leaves, pilose, laxly 3–6-flowered towards the summit. *Bracts* lanceolate, pilose, subpersistent. *Pedicels* pilose. *Calyx* pilose, tube short, segments lanceolate, pilose. *Standard* glabrous, 8–10 mm. long ; keel boat-shaped, obtuse, a little shorter than the standard. *Pod* not seen.

CAPE PROVINCE.—Komgha, *R. Schlechter, Flanagan* No. 854 ; Morugha, *R. Schlechter* No. 6170.

This plant is very closely allied to the preceding and perhaps not specifically distinct. The noticable features are the trifoliolate leaves, the terminal leaflets generally broader than long, the long peduncles much longer than the leaves, laxly 3–6-flowered near the summit.

Series 9.—*Flowers* 10–12 *mm. long in very lax raceme. Terminal leaflets suborbicular or broadly ovate, hirsute. Stem rufo-pilose.*

22. **R. ovata,** Wood and Evans in "Journ. Bot." (1897), 350.

Stem suffruticose, suberect, densely rufo-pilose. *Stipules* linear lanceolate, ± 6 mm. long. *Leaves* long petiolate, trifoliolate ; leaflets suborbicular or ovate, entire, base rounded, hispid, and with long hairs ciliate, about 3 cm. long, 2·5 cm. broad ; lateral shortly petiolulate. *Racemes* axillary and terminal longer than the leaves, bearing a few distant flowers. *Calyx* hairy, about 7 mm. long. *Standard* obovate, 10 mm. long, base auriculate and clawed, glabrous ; carina boat-shaped, apex obtuse. *Pod* oblong, acute, base narrowed, about 18 mm. long.

ZULULAND.—Near Entumeni, *Wood* No. 3987 and *Wood* No. 8534.

NATAL.—Lower Tugela, *Wood* No. 9275.

Easily recognized by the flexuous pilose stems, the suborbicular or broadly ovate leaflets, and the very lax inflorescence of yellow flowers.

Series 10.—*Flowers small,* 9–10 *mm. long, in var.* grandiflora *larger in a lax raceme. Leaflets ovate,* 2–3 *cm. long,* 15–25 *mm. broad, in typical form. Standard glabrous.*

23. **R. Harmsiana,** Schlechter, *ex* A. Zahlb. in "Ann. Mus. Nat. Hofmus Wien.," XX (1905), 26.

Stem voluble, branches filiform, puberulous. *Stipules* lanceolate, subulate, acuminate. *Terminal leaflets* 2–3 cm. long, 15–25 cm. broad ; common petiole pubescent. *Racemes* axillary, laxly several-flowered. *Calyx* campanulate, ± 8 mm. long ; segments subulate longer than the tube. *Standard* about 1 cm. long, lamina obovate, base auriculate; wings obliquely oblong; carina boat-shaped, obtuse. *Ovary* pilose, style filiform, glabrous.

EAST GRIQUALAND.—Between Mt. Insiswa and the River Umzinhlawa, *Krook* No. 2584.

NATAL.—*Rudatis* No. 1617; near Boston, *Wood* No. 11824.

Var. **Burchellii,** Burtt-Davy in "Kew Bull.," 1921, 193.

Slender voluble herb. Leaves trifoliolate, terminal somewhat rhomboid, 13–20 mm. long, 9–15 mm. broad, below sparsely glandular. *Peduncles* longer than the leaves, 5–7·5 cm. long, generally laxly 5–7-flowered. *Calyx* glandular, upper lobes short, lower longer, subulate, acuminate. *Standard* glabrous, with purple-brown lines. *Pod* strigose, reaching 2 cm. long.

CAPE PROVINCE.—Near Komgha, *Flanagan* No. 796; Van Stadensberg, *Burchell* No. 4746; Kentani, *Pegler* No. 2032; Humansdorp Div., Kromme River, *Burchell* No. 4860.

EAST GRIQUALAND.—Near Clydesdale, *Tyson* No. 2073.

NATAL.—Umzumbi, *Wood* No. 3143.

Var. nov. **grandiflora.**

Folia trifoliolata, foliolis terminalibus rhombeo-triangularibus apice acutis 30–45 mm. longis, 25–55 mm. latis. *Racemi* multiflori cum pedunculo, 8–10 cm. longi. *Flores* lutei, 12–15 mm. longi, longiuscule pedicellati, pedicellis 3–4 mm. longis. *Calyx* in toto 9–10 mm. longus, hirtus et glandulosus, dentibus superioribus 3–5 mm. longis, inferioribus 6–7 mm. longis. *Vexillum* extus glabrum.

NATAL.—Lundies Hill, *Wood* No. 11401, Natal Herb. No. 12427.

The leaflets are thin and covered with scattered hairs. The two uppermost teeth of the calyx are more or less connate, the lowest segment very narrow. It is allied to *R. flavissima* Hochst., but the carina is shorter and the calyx is longer. The wing petals are oblong with a short spur on one side.

Series 11.—*Flowers*, 10–13 *mm. Leaves trifoliolate or unifoliolate, leaflets rigid, elliptic-oblong or subrhomboid. Peduncles generally long, laxly 3–8-flowered. Standard glabrous.*

24. **R. nervosa,** Benth., *ex* Harvey, l.c. 253.

Stem prostrate or twining hispid-pubescent. *Stipules* small, narrow lanceolate or subulate. *Leaves* in typical form trifoliolate, shortly petiolate, terminal leaflets elliptic-oblong or subrhomboid, rigid, 3-nerved at base, hispido-pubescent 30–60 mm. long, 15–35 mm. broad, common petioles hispido-pubescent or villous, 3–15 mm. long or sometimes longer. *Peduncles* generally long, laxly 3–8-flowered. *Calyx* lobes lanceolate acuminate, longer than the tube, shorter than the standard. *Standard* glabrous, 8–12 mm. long. *Pod* sessile, villous.

CAPE.—Sand River and Langspruit. *Zeyher*; Winterberg, *Ecklon and Zeyher.*

NATAL.—Near Intshanga, *Wood* Nos. 6231 and 6545; near Gillits, *Wood* No. 7990; Claremont, *Wood* No. 7994.

EAST GRIQUALAND.—Clydesdale, *Tyson* No. 1056.

TRANSVAAL.—Lydenberg, *Wilms* No. 381; Hoogeveld, *Wilms* No. 385; Pretoria, *A. O. D. Mogg* No. 15636; Vereeniging, *Rogers* No. 11904; Kaalfontein, *Pole-Evans* No. H.16796; Jeppestown Ridge, Johannesburg, *Gilfillan* No. 54; Barberton, *E. Galpin*, No. 1003.

Forma **unifoliolata,** Bak. fil.

Caules teretes, flexousi. *Folia* saepissime unifoliolata, late ovata, petiolo brevi suffulta. *Racemi* laxi, 2–5-flori, foliis longiores. *Flores* ± 1 cm. longi. *Vexillum* glabrum.

NYLSTROOM.—*Mrs. De Jongh* No. 6521.

R. nervosa, Benth., differs from *R. hirsuta*, Ecklon and Zeyher, in its shorter petioles, its glabrous standard, and narrower stipules. The petals are yellow, with reddish striations. *R. nervosa*, Benth., var. *pauciflora*, Harvey, is *R. confusa*, Burtt-Davy. *Zeyher* No. 515, referred here doubtfully by Harvey, is *R. venulosus*, K. Schum.

Series 12.—*Flowers*, 12–18 *mm. Leaves trifoliolate, terminal leaflets ovate-rhomboid, acute. Racemes longer than the leaves, laxly several-flowered.*

25. **R. Caribaea,** D.C., "Prod.," II, 384; Baker in Oliver "Fl. Trop. Afr.," II.

E. gibba, E. Mey., "Linnaea," VII, 170; *R. acuminata*, Ecklon and Zeyher, 1666; *Copisma gibbum* E. Mey., "Comm.," 137.

Stems elongate, voluble or prostrate, generally pubescent. *Stipules* minute. *Leaves* trifoliolate, petiolate; terminal leaflet ovate-rhomboid, acute or sometimes obtuse, membraneous, generally 2–4 cm. long and 2–3 cm. broad; lateral leaflets unequalsided; common petiole 1–2 cm. long. *Racemes* longer than the leaves, laxly several-flowered, pedicels 2–4 mm. long. *Calyx* upper segments short and broad, lowest conspicuously longer, subulate. *Standard* glabrous, broadly ovate; wings oblong, base unguiculate; keel boat-shaped, base unguiculate. *Pod* falcate, much longer than the calyx, 24–30 mm. long.

CAPE.—Districts Uitenhage, *Ecklon* No. 1667, *Alexander* No. 117; Somerset Div., *Burchell* No. 3344, *Bowker, Burchell* Nos. 3096 and 2997; East London, *E. Galpin* No. 5684; Schoornstrom and Doornkop, *Burke*; Mossel Bay, *Rogers* No. 13348.

NATAL.—*Gerrard* No. 1902; Weenen, *Wood* No. 4470; Karkloof, *Wood* No. 7209; near Durban, *Wood* No. 7576.

BRITISH KAFFRARIA.—*Mrs. Hutton.*

DELAGOA BAY.—*J. Monteiro* No. 14.

TRANSVAAL.—Wakkerstroom, *Beeton* No. 12526.

Var. **pictam** (*E. gibba*, E. Mey., var. *pictum*, Benth.).

Copisma pictum, E. Mey. "Comm.," 135.
A more densely pubescent or tomentulose plant.

CAPE.—Somerset, *Bowker*; Howisons Poort, *Mrs. Hutton*; East London, *E. Galpin* No. 5685; Port Alfred, *Burchell* No. 4094; Komgha, *Flanagan* No. 719.

NATAL.—Inanda, *Wood* No. 692; Dist. Alexandra, *Rudatis* No. 896.

SWAZILAND.—*Miss Stewart* No. 4. ZULULAND.—Ngoye, *Wood* No. 10333.

Var. nov. **Thorncroftii.**

Leaves trifoliolate, terminal leaflets rhombeo-ovate, subacuminate. Flowers 15–18 mm. long, larger than type.

TRANSVAAL.—Saddleback Mnts., Barberton, alt. 5000 ft., *G. Thorncroft* No. 849; Barberton, *E. Galpin* No. 1308, is allied to var. *picta* (Benth.).

Series 13.—*Flowers small*, 9–11 *mm. long, in* 3–8-*flowered racemes. Terminal leaflets triangular-ovate, apex acute.*

26. **R. Dieterlenae,** Bak. fil., sp. nov.

Caulis volubilis, gracilis, pubescens. *Stipulae* angustae, 4–6 mm. longae. *Folia* trifoliolata, foliolis terminalibus triangulari-ovatis, apice acutis, 3–4 longis, 2·5–3·0 cm. latis, lateralibus inaequilateralibus, petiolo 20–25 longo suffulta. *Flores* parviusculi in racemos pauci vel plurifloros dispositi, 9–11 mm. longi. *Racemi* 3–7 cm. longi, saepius 3–8-flori. *Calyx* in toto 5 mm. longus, dentibus superioribus breviusculis. *Vexillum* 9–10 mm. longum, extus glabrum. *Carina* 9–10 longa. *Ovarium* pilis vestitum. *Legumen* ignotum.

BASUTOLAND.—Leribe, *Mrs. Dieterlen* No. 840. Natal Herb. No. 15418.

An ally of *R. minima*, D.C. The racemes are 3–8-flowered, the stipules narrow, and the flowers 9–11 mm. long. The terminal leaflets are longer and larger than in *R. minima*, D.C., and the carina is tipped with blue. The standard is glabrous externally. The young inflorescence is very hirsute.

Series 14.—*Flowers*, 10–12 *mm. Leaflets broadly ovate-orbicular, rigid, hispid-pubescent. Peduncles laxly* 3–12-*flowered. Standard pubescent.*

27. **R. hirsuta,** Ecklon and Zeyher, "Enum.," 256; Harvey, l.c. 252.

Copisma diversifolium, E. Mey., "Comm.," 135.

Stem widely spreading, flexuous, hirsute. *Stipules* ovate, acute. *Leaves* trifoliolate, petiolate; terminal leaflets broadly ovate-orbicular or rhombeo-obovate, rigid hispid-pubescent, generally 2–5 cm. long, 2·5–4 cm. broad; petioles 1–2 cm. long, hirsute. *Peduncles* elongate, laxly and distantly 3–8 or sometimes more flowered. *Flowers* 10–12 mm. long. *Standard* densely pubescent, about 10 mm. long; carina boat-shaped, 8–10 mm. long. *Pod* sessile, villous, 18–24 mm. long.

CAPE.—Philipstown, *Ecklon and Zeyher* No. 1676; Queenstown, *E. Galpin* No. 1587.

EAST GRIQUALAND.—Near Clydesdale, *Tyson* Nos. 1448 and 2193.

BASUTOLAND.—Leribe, *Mrs. Dieterlen* No. 6841.

TRANSVAAL.—Magaliesberg, *Burke and Zeyher*.

Var. **angustifolia,** Harvey, l.c. 252.

Upper leaves oblong, lower ovate.

NATAL.—Port Natal, *Gueinzius*.

Series 15.—*Flowers*, 13–15 *mm. Leaves trifoliolate, terminal leaflets ovate, thickish, canotomentose below. Peduncles generally longer than the leaves, laxly few-flowered.*

28. **R. argentea,** Harvey, l.c. ii, 253.

Glycine argentea, Thunb., "Fl. Cap.," 292.

Stem voluble, tomentose. *Stipules* ovate, acute. *Leaves* trifoliolate, petiolate; terminal leaflets ovate, thickish, canotomentose below, 15–33 mm. long, 13–22 mm. broad; terminal petiolules 3–6 mm. long; common petioles 10–16 mm. long. *Peduncles* generally longer than the leaves, occasionally shorter, laxly few-flowered. *Pedicels* rather long, 4–6 mm. *Calyx* pubescent, its upper segments broadly lanceolate, lowest rather longer subulate. *Standard* pubescent. *Pod* not seen.

CAPE.—*Thunberg, Burchell* No. 5122; Knysna, *Newdigate* No. 207; Stockenstroom, *W. C. Scully* No. 4886.

There is a specimen of *Glycine argentea* in Thunberg's Herbarium which agrees with that of Burchell.

This species is easily recognized by the broadly ovate leaflets canotomentose below. The flowers are rather large, 13–15 mm. long.

Series 16.—*Flowers small*, 6–8 *or* 9 *mm. long. Terminal leaflets rhombeo-ovate or rhombeo-obovate.*

29. **R. minima,** D.C., "Prod.," II, 385; Harvey, l.c. ii, 254.

Dolichos minimus, "Linn.," sp. pl. 726; *Copisma tenue* and *Copisma falcatum*, E. Mey., "Comm.," 136.

Stem slender, voluble, thinly downy or glabrescent. *Stipules* small, narrow. *Leaves* trifoliolate, petiolate; terminal leaflets rhombeo-ovate or rhombeo-obovate, varying much in size and shape; lateral leaflets unequalsided; common petiole 5–25 mm. long. *Racemes* laxly several or many flowered, longer than the leaves. *Flowers* small, 6–9 mm. long. *Calyx* 3–4 mm. long, lowest lobe longer than the others, much shorter than the petals. *Standard* orbicular-obovate, 5–7 mm. long. *Carina* boat-shaped. *Pods* falcate, 10–17 mm. long, about 4 mm. wide, puberulent, seeds brown.

NATAL.—Durban, *Wood* No. 7556; Port Natal, *Dr. Grant*; near Durban, *Wood* No. 6383.

TRANSVAAL.—Barberton, *E. Galpin* No. 1196; Shilouvane, *Junod* No. 1114; Potgietersrust, *Leendertz* No. 2328, *H. Bolus* No. 11120; Komatipoort, *R. Schlechter* No. 11773.

LOURENCO MARQUES.—*R. Schlechter* No. 11566.

A widely spread little plant. May be recognized by the lax raceme of small flowers, 6–8 or sometimes 9 mm. long.

Series 17.—*Flowers* 10–12 *mm. long in lax* 10–24-*flowered racemes. Terminal leaflets ovate-triangular, acute. Stem rufous hirsute.*

30. **R. stenodon,** sp. nov.

Caulis volubilis rufo-hirsutus. *Stipulae* lanceolatae, acuminatae, rufo-hirsutae, 5–6 mm. longae. *Folia* trifoliolatae, foliolis terminalibus ovate-triangularibus ± 5 cm. longis, et 4–4·5 cm. latis, lateralibus inaequilateralibus, omnibus utrinque pubescentibus, subtus nerviis rufo-hirtis, petiolo communi rufo-hirsuto 25–30 mm. longo praedita. *Racemi* saepius 10–24-flori, laxi. *Flores* flavi 10–12 mm. longi. *Calyx* in toto, 8–9 mm. longus, glandulosus et hirsutus, dentibus infimis angustissimis et longioribus, dentibus supremis connatis. *Vexillum* obovatum, unguiculatum. *Alae* oblongae uno latere calcaratae. *Carina* naviculariformis. *Ovarium* pilis vestitans.

NATAL.—Oliver's Hoek Pass, *Wood* No. 3344. Alt. 4800 ft. In flower Jan., 1886.

An ally of *R. Pentheri*, Schlechter. The flowers are yellow, the calyx is hirsute and glandular, the lowest segment conspicuously longer than the rest and very narrow. The wing petals have a prominent tooth on one side.

Series 18.—*Flowers,* 10–12 *mm. Leaves trifoliolate, terminal leaflets rhombeo-obovate. Racemes lax, many flowered.*

31. **R. memnonia,** D.C., var. **prostrata,** Harvey, l.c. 253.

Stem flexuous, longitudinally striate, pubescent. *Stipules* lanceolate deciduous. *Leaves* trifoliolate, petiolate, terminal leaflets rhombeo-obovate generally, 10–12 mm. long and about the same breadth, terminal petiolules pubescent, 3–4 mm. long; lateral leaflets unequalsided; common petiole 5–10 mm. long. *Racemes* longer than the leaves, lax, many-flowered. *Flowers* pendent. *Calyx* glandular, about 10 mm. long; segments longer than the tube, lanceolate. *Standard* pubescent on back, 10–11 mm. long; carina about 10 mm. long, boat-shaped. *Pod* 15–20 mm. long, pubescent.

TRANSVAAL.—Blomberg, *R. Schlechter* No. 4647; Magaliesberg, *Burke* No. 101; Shilouvane, *Junod* No. 768; Komatipoort, *R. Schlechter* No. 11750.

DELAGOA BAY.—*Bolus* No. 1143.

NATAL.—*Gerrard* No. 1949.

The plant described by Harvey as typical *R. memnonia* I have placed under *R. albissima*, Gandoger. It is in all parts tomentose-canescent or silky.

Series 19.—*Flowers,* 10–12 *mm. Leaflets densely velvety, thick. Peduncles elongate, laxly several-flowered. Standard pubescent.*

32. **R. crassifolia,** Benth. in Harvey, l.c.

R. longipes, Harms in Engler's "Jahrb.," XXVI, 306.

Stem procumbent. *Branches, petioles,* etc., densely velvety. *Stipules* oblong obovate. *Leaves* trifoliolate, petiolate; terminal leaflets elliptic-ovate, subobtuse, softly velvety, 50–55 mm. long, 30–42 mm. broad; petioles 10–25 mm. long, hairy. *Peduncles* elongate, laxly several-flowered or sometimes many-flowered. *Calyx* silky, villous, 6–7 mm. long; segments longer than the tube, shorter than the standard. *Standard* pubescent, 8–10 mm. long; carina boat-shaped. *Pod* sessile, villous, 20–25 mm. long, 7–8 mm. broad.

Transvaal.—Magaliesberg, *Burke and Zeyher* ; between Kaap and Crocodile Rivers, *E. Galpin* No. 1067 ; Lydenberg, *Wilms* No. 395 ; near Pretoria, *McLea* No. 3153 ; Shanskop Fort, *Pole-Evans* No. 186 ; Cerro de Pasco, near Barberton, *E. Galpin* No. 1067.

Easily recognized by the thick velvety leaves, the elongate lax-flowered peduncle, the hairy standard, and the villous pod.

Series 20.—*Flowers* 10–12 *mm. long in lax racemes much longer than the leaves. Terminal leaflets suborbicular, obtuse. Standard glabrous.*

33. **R. Pentheri,** Schlechter, *ex* A. Zahlb in "Ann. Nat. Hofmus. Wien.," XX (1905), 26.

Decumbent branches filiform, elongate, voluble, subvillose, puberulous. *Stipules* minute, obliquely lanceolate, acuminate. *Leaves* trifoliolate ; terminal leaflets rhombeo-orbicular or orbicular, obtuse, 15–25 mm. long, 12–25 mm. broad ; common petiole about 5 mm. long in type, villose-puberulous. *Racemes* elongate, much exceeding the leaves, laxly several or many flowered, longly peduncled. *Calyx* campanulate, about 7 mm. long, somewhat glandular ; segments subulate. *Standard* obovoid, base auriculate, about 11 mm. long ; wings oblong ; carina boat-shaped, obtuse. *Ovary* pilose ; style filiform, glabrous. *Pod* not seen.

Cape.—Albany Division, *Dr. Atherstone.*

East Griqualand. Near Newmarket, *Krook* No. 2631 ; near Currie's Post, *Schlechter* No. 6087.

Natal. Van Reenens Pass, *Krook* No. 2523 ; near Charlestown, *Wood* No. 5707, *Gerrard* No. 1736.

Basutoland.—Leribe, *Dieterlen* No. 112. Kaffraria, *Baur.*

Var. **Hutchinsoniana,** Burtt-Davy and Bak. fil. in "Kew Bull.," 1921, 193.

Prostrate herb. Stems hirsute. *Leaves* sessile or subsessile ; terminal leaflets suborbicular, obtuse, 30–34 mm. long, 30–33 mm. broad. *Racemes* reaching 15–21 cm. long, laxly-flowered. *Flowers* about 1 cm. long. *Calyx* hirsute, more or less glandular ; lobes acuminate. *Corolla* apex purplish ; standard yellow, with purple lines. *Pod* not seen.

Natal.—Karkloof, *J. Wylie* in Herb. Wood No. 7212 ; Edendale, *Wood* No. 4601 ; Van Reenen, *Wood* No. 6674 ; near Northdene, *Wood* No. 3180.

East Griqualand.—Near Clydesdale, *Tyson* No. 2068.

Transvaal.—Johannesburg, *Gilfillan* No. 211.

Series 21.—*Leaflets ovate-orbicular or subrhomboid, below densely gland-dotted. Flowers* 10–12 *mm. long, in racemes longer than the leaves. In var.* Cooperi, *Harvey, flowers larger.*

34. **R. adenodes,** Ecklon and Zeyher, "Enum.," 254 ; Harvey, l.c. ii, 254.

R. amatymbica, Ecklon and Zeyher No. 1671 ; *Copisma effusum*, E. Mey., "Comm.," 135.

Prostrate, subglabrous or minutely puberulous. *Stipules* lanceolate. *Leaves* trifoliolate, petiolate ; terminal leaflets ovate-orbicular or subrhomboid, acute or obtuse, resinous-dotted, generally 7–25 mm. long, 10–25 mm. broad ; terminal petiolule 2–3 mm. long ; lateral leaflets unequalsided ; common petiole 10–24 mm. long. *Peduncles* longer than the leaves, shortly and closely racemose near the summit. *Calyx* pubescent, its segments lanceolate, longer than the tube. *Standard* glabrous or puberulent, glandular, longer than the calyx. *Pod* hairy, 15–18 mm. long.

Cape.—Somerset East Division, Boschberg, *Bolus* No. 322 ; East London, *E. Galpin* No. 7338 ; Aliwal North, *Bolus* No. 10472 ; Queenstown Dist., *Mrs. Barber*, *E. Galpin* No. 1595 ; Komgha, *Flanagan* No. 764 ; near Philipstown, *Ecklon* No. 1670.

Zululand.—*Mckenzie.* Tembukiland.—*Ecklon* No. 1671.

Natal.—*Krauss* No. 301 ; Drakensberg, *Rehmann* No. 7067 ; Inanda, *Wood* Nos. 244, 419, 297 ; between Greytown and Newcastle, *Wilms* No. 1950.

East Griqualand.—Near Clydesdale, *Tyson* No. 1447–1055; Umzumwubu Flats, *Tyson* No. 1132.

Kaffraria.—*T. Cooper* No. 155; *Baur* Nos. 24, 125, 761.

Transvaal.—Pretoria, *Rehmann* No. 4648; Lydenberg, *Wilms* Nos. 281, 282; Fairy Glen, *Leendertz* No. 318; Wakkerstroom, *Beeton* No. 12393; Heidelberg, *Gilfillan* No. 76; Vereeniging, *Gilfillan* No. 142; Standerton, *Burtt-Davy* No. 2323.

Var. **laxiflora,** Burtt-Davy in Herb., Kew.

Pedunculi elongati, laxiflori. *Flores* parviusculi, 7–8 mm. longi.

Natal.—Pietermaritzburg, *Dr. Sutherland*, Herb., Kew.

The leaflets are rhombeo-ovate pointed, 10–17 mm. long, 9–13 mm. broad.

Var. **Cooperi** (*R. Cooperi*, Harvey, ms.)

Foliola majora late ovata vel suborbicularia. *Pedunculi* longi. *Flores* majores, 14–18 mm. longi.

East Griqualand.—Near Fort Donald, *Tyson* No. 1637; Clydesdale, *Tyson* No. 2065.

Orange Free State.—*T. Cooper* No. 1012.

Natal.—Gillit's, *Wood* No. 11503; Lynedoch, *Wood* No. 4538; Nottingham Road, *Wood* No. 6042. Kreils Country.—*Bowker*.

This is a climbing plant with orange-coloured flowers.

Series 22.—*Flowers,* 12–15 *mm. Leaves trifoliolate, leaflets large, softly villous. Peduncles elongate, densely racemose beyond the middle.*

35. **R. sigmodes,** Benth., *ex* Harvey, l.c. ii. 251.

Sigmodostyles villosa, Benth. in Hook, "Lond. Journ.," II, 93.

Stem robust, prostrate, softly villous. *Stipules* broadly triangular. *Leaves* trifoliolate, subsessile or shortly petiolate; terminal leaflets cordate-ovate or suborbicular, rugose, thick, velvety, 7–11 cm. long, 6–12 cm. broad. *Peduncles* elongate, densely racemose beyond the middle. *Calyx* 7–9 mm. long, villous, its segments longer than the tube. *Standard* glabrous, 12–13 mm. long; keel 13–14 mm. long. *Pod* falcate, hairy, 20–28 mm. long, sessile, obtuse.

Natal.—Near Pietermaritzburg, *Krauss*; near Howick, *Wood* Nos. 8384 and 8665; Inanda, *Wood* No. 1059; near Pinetown, *Wood* No. 3406.

East Griqualand.—Zuurberg, *Tyson* No. 1581.

Transvaal.—*Wilms* No. 387 (forma).

Wilms No. 387, issued with a ms. name, seems a form of this species, with more angled leaves than usual.

Series 23.—*Leaflets glandular. Racemes dense, many-flowered. Flowers about* 15 *mm. long. Standard glandular.*

26. **R. chrysantha,** Schlechter, *ex* A. Zahlb. in "Ann. Nat. Hofmus. Wien.," XX (1905), 27.

Decumbent at length, voluble; branches filiform, more or less compressed, angular, puberulous. *Stipules* lanceolate, acuminate. *Leaves* trifoliolate, petiolate; terminal leaflets ovate-suborbicular, 18–30 mm. long, 15–30 mm. broad, below glandular; common petiole 20–35 mm. long. *Racemes* longly peduncled, densely many-flowered (15–25), much exceeding the leaves. *Calyx* campanulate, about 10 mm. long, glandular; segments linear-lanceolate. *Standard* obovoid, about 13 mm. long; wings obliquely subfalcate-spathulate; carina boat-shaped. *Ovary* pilose; style filiform, glabrous. *Pod* not seen.

Natal.—Ixopo, *Krook* No. 2547, *Schlechter* No. 6641; District Alexandria, *Wilms* No. 1305.

Easily recognized by its dense raceme, glandular leaves, and glandular standard.

D.—STEM VOLUBLE. LEAVES NARROWER.

Series 24.—Leaves trifoliolate, leaflets elliptic-oblong or oblong. Peduncles 1–2-flowered, shorter than leaves.

37. **R. puberula,** Harvey, l.c. 255.

Copisma tottum, E. Mey., "Comm.," 133; *Eriosema puberulum*, Ecklon and Zeyher, 1677; *Hedysarum ciliatum*, Thunbg. "Fl. Cap.," 594; *Desmodium? ciliatum*, D.C., "Prod.," II, 333.

Root woody. *Stems* several, spreading, prostrate or subvoluble. *Stipules* lanceolate. *Leaves* trifoliolate, very shortly petiolate; leaflets elliptic-oblong or oblong-rigid; terminal leaflets 24–30 mm. long, 8–16 mm. broad. *Peduncles* 1–2-flowered, shorter than the leaves. *Flowers* 10–13 mm. long. *Calyx* villous, 6–7 mm. long, its segments longer than the tube, shorter than the petals. *Standard* glabrous, longer than the calyx, 10–12 mm. long; carina shorter than the standard. *Pod* sessile, very villous, 12–16 mm. long seeds.

CAPE.—Galgebosch, *Thunberg*; Albany Division, *Bowie*, *Burchell* Nos. 3498 and 4189; Visch River, *Hutton*; near Grahamstown, *P. MacOwan* No. 473; Mossel Bay Division, *Burchell* No. 6210; Uitenhage, *Ecklon* No. 1577; Riversdale Division, near Spiegel River, *Burchell* No. 7206; Kingwilliamstown Division, *Tyson* No. 853. NATAL.—Camperdown, *Miss Franks* No. 12528. BRITISH KAFFRARIA.—*T. Cooper* No. 539. TRANSVAAL.—Magaliesberg, *Burke*.

Easily recognized by the several spreading subvoluble stems, the trifoliolate leaves with rigid elliptic-oblong or oblong leaflets, and the few-flowered inflorescence shorter than the leaves.

Series 25. Leaves usually trifoliolate, rarely unifoliolate; leaflets ovate, or oblong or lanceolate, petiolate. Peduncles 1–3-flowered.

38. **R. Totta,** D.C., "Prod.," II. 388; Harvey, l.c. ii, 255.

Glycine Totta, Thunberg, "Flora Cap.," 591.

Procumbent or subvoluble. *Stem* filiform, hispido-pubescent or glabrate. *Stipules* small, ovate-lanceolate, rigid. *Leaves* in typical form, trifoliolate, petiolate; leaflets in typical form, ovate or ovate-oblong, reticulate, terminal leaflets 10–25 mm. long, 5–12 mm. broad; common petioles 5–15 mm. long; lateral leaflets somewhat unequalsided. *Peduncles* filiform, equalling the petioles or longer, 1–3-flowered. *Calyx segments* longer than the tube, but shorter than the standard. *Standard* glabrous, 6–9 mm. long. *Pod* oblong, sessile, pilose, pubescent.

CAPE.—Galgebosch, *Thunberg*, type; Grahamstown, *MacOwan* No. 462; Humansdorp Division, *Burchell* No. 4824, *Burtt-Davy* No. 12088.

BECHUANALAND.—*Burchell* Nos. 2433, 2487, 2569.

NATAL.—Ladysmith, *Wood* No. 8254; Phoenix, *Schlechter* No. 3027.

The type of *R. Totta* in Thunberg's Herbarium has ovate or ovate-oblong leaves, *Copisma paniculatum*, E. Mey., from Magaliesberg in the Transvaal, and Katrivierspoort, has longer and narrower leaflets, but is not specifically distinct.

Var. **Fenchelii,** Schinz in "Vierteljahrschrift Nat. Ges. Zurich," LII, 426 (1907).

Stem grey puberulous. *Leaves* trifoliolate.

GREAT NAMAQUALAND.—Keetmanshoop, *Fenchel* No. 195.

Var. **namaensis,** Schinz. in Herb.

Leaves trifoliolate, leaflets lanceolate or ovate-lanceolate, grey puberulous.

GREAT NAMAQUALAND.—Seeheim, alt. 4000 ft., *Pearson* No. 3741; Keetmanshoop, *Fenchel*. Intermediate between *R. Totta*, D.C., and *R. longiflora*, Schinz.

Var. **pilosa,** Harvey, l.c. ii, 256, pro species.

Copisma pilosum, E. Mey., "Comm.," 133.

Stem patently pilose. *Leaves* trifoliolate, leaflets of lower leaves ovate-oblong of the upper linear.

PORT NATAL—*Gueinzius ;* Zuureberg and between the Omtendo and Omsamculo, *Drège.*

This is hardly specifically distinct from *R. Totta,* D.C.

Var. **unifoliolata,** Burtt-Davy, in "Kew Bull.," 1921, 49, pro species.

Leaves unifoliolate or trifoliolate, leaflets ovate, common petiole short, 1–2 mm. *Flowers* 7–8 mm. long.

TRANSVAAL.—Ermelo, *Burtt-Davy* No. 17403. HOOGEVELD.—*Rehmann* No. 6836.

Var. **brevipetiolata,** Bak. fil.

Caules flexuosi, pilosi vel tomentosi. *Stipulae* lanceolatae, striatae. *Folia* trifoliolata, anguste oblonga vel elliptica, foliolis terminalibus 15–23 mm. longis, 5–12 mm. latis, apice acutis, petiolo communi brevi, 2–4 mm. longo suffulta. *Flores* 8 mm. longi, pedunculati, saepissime solitarri rarius bini. *Calyx* 6–7 mm. longus, pilosus. *Legumen* 10–15 mm. longum, pilosum.

TRANSVAAL.—Johannesburg, Jeppestown Ridge, *Gilfillan* Nos. 22 and 65 ; Nat. Herb., Pretoria, Nos. 6103 and 6104.

Ally of *R. Totta,* D.C., var. *pilosa,* Harvey. The noticeable features are the pilose or tomentose stems, the short petioles. It was distributed as *R. puberula,* Harvey.

Var. **graciliflora** (*R. graciliflora* Harms) in Herb. Mus. Brit.

Stems flexuous, filiform, pubescent or nearly glabrous. *Stipules* lanceolate, longitudinally striate, 4–5 mm. long. *Leaves* trifoliolate, petiolate ; terminal leaflets linear-lanceolate, glabrous above with a few scattered hairs below, 3–4·5 cm. long, 3–5 mm. broad ; terminal petiolules 4 mm. long ; lateral leaflets slightly unequalsided at base ; common petioles 15–25 mm. long. *Peduncles* slender, generally one-flowered. *Calyx* hairy ; segments lanceolate, longer than the tube, but shorter than the corolla. *Standard* glabrous, 7–9 mm. long. *Pod* about 16 mm. long, hairy outside, seeds reddish brown.

CAPE.—Queenstown, *E. Galpin* No. 1547. NATAL.—Mooi River, *J. Webb* No. 7011. EAST GRIQUALAND.—Kokstad, *Tyson* No. 1336. BASUTOLAND.—Leribe, *Mrs. Dieterlen* No. 6839. ORANGE FREE STATE.—Bethlehem, *T. Potgieter* No. 59.

TRANSVAAL.—Lydenberg, *Wilms* No. 367 ; Modderfontein, *Conrath* No. 259 ; near Pretoria, *Bolus* No. 7750 ; Ermelo, *G. McCall* No. 7592 ; Davel, *W. J. Wayland, sine no.* ; near Pretoria, *Pole-Evans* No. 51.

A plant from Camperdown, *Franks* (Com. *Medley Wood* No. 11826), is a form of this species.

Differs from the type of *R. Totta* in Thunberg's Herbarium by the linear lanceolate leaves.

39. **R. longiflora,** Schinz in "Bot. Verh. Brand.," XXX, 168 (1889).

Stems slender, voluble, pilose. *Leaves* trifoliolate, petiolate ; terminal leaflets narrow, lanceolate, acute, mucronate, 13–30 mm. long, 2·5–5 mm. broad ; terminal petiolules 2 mm. ; lateral leaflets unequalsided ; common petiole reaching 8 mm. long. *Peduncles* axillary, two-flowered. *Calyx* bilabiate ; segments as long as or a little longer than the tube. *Standard* glabrous, 22 mm. long ; keel about the same length ; wings shorter, about 13 mm. long. *Pod* pilose, sessile, about 23 mm. long and 7 mm. broad.

GREAT NAMAQUALAND.—Osis.

Noticeable on account of the narrow lanceolate terminal leaflets and two-flowered racemes.

R. amboense, Schinz., is allied, but the flowers are smaller.

R. Totta, D.C., var. *namaensis*, Schinz, seems intermediate between *R. Totta* and the present species. Flowers longer than in *R. Totta*, D.C.

Series 26.—*Leaflets lanceolate or oblong-lanceolate, when young sericeous. Flowers* 8–10 *mm. long, in a very lax raceme.*

40. **R. elegantissima,** Schinz. in "Vierteljahrschrift Nat. Ges. Zurich." LII, 428 (1907).

R. sericea. Conrath in Herb., Kew.

Suffrutex with flexuous, filiform branches. *Stipules* longitudinally striate. *Leaves* trifoliolate, petiolate; terminal leaflets lanceolate, 2–4 cm. long and 8–12 mm. broad; terminal petiolules 2–3 mm. long; lateral leaflets slightly unequalsided; common petiole 8–15 mm. long. *Racemes* few-flowered, very lax. *Flowers* 8–10 mm. long. *Calyx* segments acuminate, shorter than the standard. *Standard* 7–9 mm. long. *Pod* 15–17 mm. long, pubescent, seeds dark coloured.

TRANSVAAL.—*Rehmann* No. 5545; near Pretoria, *Conrath* No. 258; Onderstepoort, *A. O. D. Mogg* No. 15674.

A suffrutex with flexuous branches. The young foliage is silvery, the leaflets are lanceolate.

Series 27.—*Leaflets oblong-ovate or ovate-lanceolate, tomentose. Flowers* 10–12 *mm. long, in very lax few-flowered racemes. Stems rufo-tomentose.*

41. **R. venulosus,** K. Schum. in "Just Jahrb.," XXVII, 496.

Dolicholus venulosus, Hiern. in "Cat. Welw. Afr. Pl.," I, 271; *R. cinnamomea*, Schinz. in "Vierteljahrschrift Nat. Ges. Zurich." LII. 429 (1907); *R. remota*, Conrath in "Kew Bull." (1908), 224.

Stem terete, densely rufo-tomentose, scandent. *Stipules* small. *Leaves* trifoliolate, oblong, ovate or ovate-lanceolate tomentose; terminal leaflets 20–35 mm. long, 10–14 mm. broad; lateral leaflets base more or less oblique; common petioles 10–15 mm. long. *Racemes* axillary, very lax, 2–5-flowered; pedicels densely pubescent, 2–3 mm. long. *Calyx* 7 mm. long; segments acuminate, longer than the tube. *Standard* 8–11 mm. long. *Pod* oblong, pilose, about 2 cm. long.

TRANSVAAL.—Magaliesberg, *R. Schlechter* No. 4162; Witpoortje, near Johannesburg, *Conrath* No. 262; Mooi River, *Burke*; Rustenburg, *Olive Nation* No. 157.

BECHUANALAND.—Kuruman Hills, *Burchell* No. 2172.

Easily recognized by the terete, scandent, cinnamon-coloured, hirsute or tomentose stem, and very lax 2–5-flowered racemes.

Zeyher No. 515 is this species.

Series 28.—*Leaves trifoliolate, leaflets oblong or oblong-lanceolate, or ovate. Peduncles slender, longer than the leaves,* 1–6-*flowered at the summit. Pod stipitate.*

42. **R. glandulosa,** D.C., "Prod.," II, 388; Harvey, l.c. 256.

Glycine glandulosa, Thunberg, "Cap.," 591; *Glycine heterophylla*, Thunberg, "Cap.," 592; *Copisma glandulosum*, E. Mey., "Comm.," 133; *Rhynchosia glandulosa, riparia, glabra*, Ecklon and Zeyher; *Glycine glabra*, Spreng; New Entdack, iii, 54. *Rhynchosia glabra*, D.C., "Prod.," II, 387; *Copisma glabrum*, E. Mey., "Comm.," 134.

Prostrate or voluble, glabrous or downy. *Stipules* ovate or sublanceolate. *Leaves* trifoliolate, petiolate; leaflets oblong or oblong-lanceolate, or ovate; terminal leaflets 10–30 mm. long, 3–16 mm. broad, resinous-dotted and paler beneath. *Peduncles* slender, longer than the leaves, 1–6-flowered at the summit. *Calyx* tube shorter than the lanceolate segments. *Standard* glabrous. *Pod* stipulate, glabrous or downy, 16–18 mm. long, tapering at base into a stipe 2–4 mm. long.

CAPE.—Common on stony hills from Capetown to Uitenhage and Albany.

Series 29.—Leaflets linear, below resinous-punctate. Pedicels axillary one-flowered.

43. **R. rigidula,** D.C., "Prod.," II, 388.

Stem erect, retrorsely cano-pubescent. *Leaflets* linear, mucronate, pubescent, below resinous-punctate. *Pedicels* axillary, one-flowered, at the middle inflexed, then deflexed, the length of the petiole. *Pod* subvillose, one-seeded, oblong.

CAPE.—*Burchell* No. 2587.

This is only known to me from De Candolle's description, of which the above is a translation. I think there is some error in the number, as this number belongs to a plant of another family.

E.—STEMS RIGID OR SUBRIGID, USUALLY ERECT.

Series 30.—Leaves trifoliolate, subsessile or shortly petiolate, terminal leaflets elliptic-oblong or lanceolate-oblong. Peduncles shorter than the leaves, closely few-flowered in var. densiflora, *mostly terminal and more densely flowered.*

44. **R. Orthodanum,** Benth., *ex* Harvey, l.c. 257; Wood, "Natal Plants," t. 220.

Orthodanum latifolium, sordidum, and *argenteum,* E. Mey., "Comm.," 131–2; *Eriosema sericeum,* Ecklon and Zeyher, "Enum.," 256.

Erect suffruticose, silky-villous or glabrescent. *Stipules* lanceolate. *Leaves* trifoliolate, subsessile, or shortly petiolate; leaflets elliptic-oblong or lanceolate-oblong, or oblanceolate, 20–60 mm. long, 5–20 mm. broad. *Peduncles* shorter than the leaves, closely few-flowered. *Calyx* 8–10 mm. long; lobes lanceolate-acuminate, much longer than the tube, either shorter or longer than the standard. *Standard* glabrous, suborbicular-obovate; keel boat-shaped. *Pod* 12–16 mm. long, silky, sometimes glabrescent.

CAPE.—Winterberg, above Philipstown, Kat River, *Ecklon and Zeyher*; Kentani, *Miss Pegler.*

NATAL.—Port Natal, *Drège, Krauss* No. 374; in open ground all over the Colony, fide *Wood.*

BRITISH KAFFRARIA.—*T. Cooper* No. 294.

TRANSVAAL.—Near Crocodile River, *R. Schlechter* No. 3921; Johannesburg, *Dr. Rand* No. 951.

Var. **Muhlenbeckii,** Harvey, l.c. 257.

Orthodanum Muhlenbeckii and *O. glabratum,* Meisner in Hook, "Lond. Journ.," II, 91–2.

Stems dwarf. *Leaves* and *flowers* smaller, terminal; leaflets generally 10–15 mm. long, 3–7 mm. broad.

CAPE.—Near Kromme River, Uitenhage; Albany Division; Uitenhage, *Bowie*; Queenstown, *E. Galpin* No. 1958.

Var. nov. **densiflora.**

Pedunculi saspissime terminale copiose floriferi.

NATAL.—District Alexandra, *H. Ridatis* No. 1349.

This species is variable in size and shape of leaflets. It occurs as far north as Gazaland, where it was collected near Chipete by *C. F. M. Swynnerton.*

Series 31. Terminal leaflets broad, cinereous-tomentose. Racemes few-flowered. Flowers 16–17 mm. long.

45. **R. spectabilis,** Schinz in "Vierteljahrschrift Nat. Ges. Zurich," LV, 236 (1910).

Fruticose, stems canotomentose. *Stipules* small, hairy. *Leaves* trifoliolate, petiolate; terminal leaflets broadly ovate or suborbicular ovate, base cordate or subcordate, 3–5 cm. long, 3–5·5 cm. broad; terminal petiolules 8–10 mm. long; lateral leaflets unequalsided, all markedly reticulate and canotomentose below. *Racemes* few-flowered, shorter than the leaves. *Calyx* canotomentose externally, about 11 mm. long; lobes lanceolate. *Standard* covered with white hairs externally; keel about as long as the standard. *Pod* 20–25 mm. long, apiculate, hairy.

Transvaal.—Moord Drift, *R. Schlechter* No. 4310, *Leendertz* No. 2228.

A canotomentose shrub with few-flowered racemes, and flowers 16–17 mm. long.

Series 32.—*Leaves shortly petiolate, terminal leaflet oval or suborbicular. Raceme shorter than the leaves, few-flowered. Stem terete.*

46. **R. Rudolfi,** Harms, in "Notizblatt. Bot. Gard.," Berlin, B.Ld. VIII, 156 (1922).

Species ad *R. ambacensem,* K. Schum (*Dolicholum ambacensem,* Hiern) affinis. *Caulis* rigidus, erectus, ferrugineo-tomentosus. *Stipulae* ferrugineo-tomentosae mox delapsae. *Folia* trifoliolata, foliolis terminalibus ovalibus vel ovali-suborbicularibus utrinque tomentosis, 4–4·5 cm. longis, 25–33 mm. latis, foliolis lateralibus saepius minoribus, 3–3·5 cm. longis, 15–30 mm. latis, petiolo communi ferrugineo-tomentoso 5–10 mm. longo suffulta petiolulis foliolorum terminalium 6–8 mm. longis etiam ferrugineo-tomentosis. *Racemi* foliis breviores saepius 2–3-flori, rhachi ferrugineo-tomentosa. *Calycis tubus* brevis extus ferrugineo-tomentosus, lobis angustis lineari-lanceolatis tubo multoties longioribus. *Petala* delapsa. *Ovarium* pilis albidis dense villosum.

Transvaal.—Near Crocodile River, alt. 1600 m., *R. Schlechter* No. 3910, Herb. Zurich.

This is an erect plant, the stem being ferrugineo-tomentose. The leaves are trifoliolate, the terminal leaflets are longer than they are broad. The racemes are 2–3-flowered. Calyx 13–14 mm. long, of which the tube is only 4 mm. It differs from *R. ambacensis,* K. Schum, by the shape of the terminal leaflets and the tomentum. It is also allied to *R. spectabilis,* Schinz.

Series 33.—*Leaflets ovate or orbicular-ovate. Peduncles axillary, two-flowered. Flowers* 18–20 *mm. long.*

47. **R. komatiensis,** Harms in Engler's "Jahrb.," XXVI, 306.

Fruticose erect, branches pubescent. *Leaves* trifoliolate, shortly petiolate; terminal leaflets ovate or orbicular-ovate, 15–27 mm. long, 12–20 mm. broad; lateral leaflets unequalsided; common petiole 5–10 mm. long, tomentose. *Peduncles* axillary, short, about two-flowered; pedicels equalling calyx or shorter. *Calyx* obliquely campanulate; teeth ovate; lowest longest. *Corolla* about 18 mm. long, about three times the length of the calyx; standard pilose externally. *Ovary* and young pod densely hirsute.

Transvaal.—Between Spitzkop and the Komati River, *Wilms* No. 374; Shilovane, *Junod* No. 541.

A shrub with ovate or ovate-orbicular leaflets and two-flowered peduncles. The corolla is about three times the length of the calyx, which is an interesting feature of this species.

Section 34.—*Leaves petiolate, terminal leaflet ovate-lanceolate. Racemes shorter than the leaves. Flowers large. Standard* 15–18 *mm. long in type. Upper calycine lobes shorter than lowest lobe.*

48. **R. clivorum,** S. Moore in "Journ. Bot.," XVI, 131 (1878).

Suffruticose erect. *Stipules* rather large, oblong-acuminate. *Leaves* trifoliolate, petiolate; terminal leaflet ovate-lanceolate, below conspicuously nerved, 5–6 cm. long, 18–25 mm. broad; lateral leaflets unequalsided. *Racemes* shorter than the leaves, few-flowered.

Flowers yellow, perfumed. *Calyx lobes* oblong, acute, unequal; lower longer, slightly longer, than the keel; upper somewhat broader; tube about 5 mm. long; lowest lobe 11–12 mm. long. *Standard* 15–18 mm. long, ovate, about as long as the carina; carina boat-shaped, obtuse, base longly unguicelate. *Pod* about 15 mm. long, seeds subreniform.

TRANSVAAL.—Near Pilgrims Rest, *J. McLea* No. 3033; Ivy Range, alt. 5000 ft., *Thorncroft* No. 342.

Var. nov. **longicalycina.**

Folia trifoliolata, foliolis ovato-lanceolatis. *Calycis lobis* inferioribus, 20–22 mm. longisquam religuiis et carinam longioribus, calyx in toto 26–28 mm. longus.

TRANSVAAL.—Pietersburg, *Isobel MacCallum* No. 1415, Herb. Kew.

This variety differs in having a longer calyx and rather longer leaflets.

This species is a small shrub and is easily recognized by the erect habit, large flowers, and ovate-lanceolate leaflets.

R. pycnantha, Harms, is doubtfully distinct.

Series 35.—*Silky-silvery plants. Leaves trifoliolate. Raceme few-flowered, generally shorter than leaves, rarely longer. Flowers* 16–23 *mm. long. Standard pubescent.*

(a) *Leaflets broadly ovate or cordate-ovate.*

49. **R. nitens,** Benth., in Harvey, l.c. 257.

Erect suffruticose, everywhere silky-silvery. *Stem* terete or subterete. *Stipules* obsolete. *Leaves* trifoliolate, petiolate; terminal leaflets broadly ovate or cordate-ovate; lateral leaflets unequalsided; common petiole, 6–12 mm. *Racemes* 2–3-flowered, shorter than the leaf. *Flowers* 16–18 mm. long, yellow. *Calyx* much shorter than the petals, 7–8 mm. long, lobes shorter than the tube. *Standard* pubescent, 16–18 mm. long, about twice as long as the calyx; carina boat-shaped, a little shorter than the standard. *Pod* densely pilose, 3 cm. long.

TRANSVAAL.—Magaliesberg, *Burke and Zeyher*; Waterkloof, Pretoria, *I. C. Verdoorn* No. 40; Meintjes Kop, *Pole-Evans* No. 356.

This is an erect suffrutex with silky-silvery foliage and yellow flowers. The standard is pubescent and about twice as long as the calyx.

(b) *Leaflets longer, oblong-obovate. Flowers larger.*

50. **R. Galpini,** sp. nov.

Suffrutex erectus, caulibus juvenilibus tomentosis. *Folia* trifoliolata, praecique subtus argenteo-sericea, foliolis terminalibus oblongo-obovatis, 4–5 cm. longis, 2–2·5 cm. latis, foliolis lateralibus inaequilateralibus, angustioribus 3·5–4 cm. longis, 12–15 mm. latis, petiole communi 3–6 mm. longo praedita. *Racemi* pluriflori. *Flores* majusculi, 20–23 mm. longi. *Vexillum* extus pilis vestitum calyce distincte longius. *Calyx* extus pubescens, in toto 10 mm. longus, dentibus lanceolatis 5 mm. longis tubo subaequilongis. *Ovarium* pilis flavidis vestitum. *Legumen* ignotum.

TRANSVAAL.—Barberton, mountain sides, Musidora, *E. E. Galpin* No. 442. Differs from *R. nitens* in the much longer and differently shaped leaflets.

Series 36.—*Leaves petiolate, terminal leaflets rhombeo-ovate, softly pubescent below. Flowers pedicellate. Standard* 18 *mm. long.*

51. **R. Bakeri,** Schinz in "Bull. Herb. Boiss," Ser. II (1908), 628.

Fruticose probably erect, branches pilose. *Stipules* not seen. *Leaves* petiolate trifoliolate, terminal leaflets rhomboideo-ovate or suborbicular-ovate, coriaceous apex shortly acuminate, about 6 cm. long and 5 cm. broad; lateral leaflets unequalsided; common petiole 25 mm. long. *Inflorescence* racemose. *Calyx* hirsute, the lowest segment being longer than the rest. *Standard* glandular externally, about 18 mm. long and 12 mm. broad; wings about 3 mm. broad; carina 15 mm. long, blunt and somewhat longer than the wings. *Ovary* and young pods densely hirsute.

Transvaal.—Terminus of Selati Railway, *Junod* No. 1585.

A shrub with trifoliolate leaves and rhomboid-ovate leaflets. The calyx is glandular, also the standard.

Series 37.—*Leaves viscidly hairy and resin-dotted, small, oblong, bullate. Peduncles short,* 1–2-*flowered.*

52. **R. bullata.** Benth., *ex* Harvey and Sonder, l.c. ii, 257.

Hidrosia bullata, E. Mey., "Comm.," 89; *R. uncinata*, Schlechter in Herb. Mus. Brit.

Shrubby erect, branched, viscidly hairy, and resin-dotted. *Stipules* ovate-acuminate, longer than the petiole. *Leaves* trifoliolate, on very short petioles; leaflets oblong, small, bullate, with recurved margins; terminal leaflets 5–8 mm. long, 2–3·5 mm. broad. *Peduncles* scarcely longer than the leaves, 1–2-flowered. *Calyx* glandular; lobes scarcely longer than the tube. *Standard* glabrous, 12–15 mm. long, with a longish claw; carina equalling the vexillum. *Pod* 10–12 mm. long, oblong, compressed, sparsely pilose.

Cape.—Clanwilliam Div., Wupperthal, *Drège, Bolus* No. 8990; Packhuis Berg, *R. Schlechter* No. 8661.

A very distinct species, being an erect, viscidly hairy little shrub. The peduncles are short and 1–2-flowered.

Series 38.—*Terminal leaflets elliptical. Racemes rather longly peduncled. Stems distinctly angled.*

53. **R. angulosa,** Schinz in "Bull. Herb. Boiss.," Ser. II (1908), 628.

Rootstock woody, branches somewhat flexuous, angled, canopilose. *Stipules* lanceolate. *Leaves* trifoliolate, very shortly petiolate; terminal leaflets elliptical hairy on the back, 3–4·5 cm. long, 10–20 mm. broad; lateral leaflets somewhat smaller; common petiole canopilose 2–4 mm. long. *Racemes* axillary, longly peduncled, about as long as leaves or slightly shorter. *Calyx* pilose with long hairs; tube 3 mm. long; the lowest segment is about 9 mm. long, and is longer than the upper segments. *Standard* glabrous, 13–15 mm. long, 10 mm. broad; carina blunt; wings narrow. *Pod* 20–23 mm. long and about 7 mm. broad.

Transvaal.—Mountain sides, Barberton, *E. Galpin* No. 1095, alt. 4500–5000 ft.; Messina, near Barberton, *Galpin* No. 507.

This is a dwarf shrub with angular stems, trifoliolate very shortly petiolate leaves, and a raceme of 3–8 orange-coloured flowers, the standard being streaked and reddish.

Series 39.—*Terminal leaflet obovate, base cuneate. Racemes longer than the leaves, many-flowered.*

54. **R. Woodii,** Schinz in "Bull. Herb. Boiss" (1894), 197, tab. iii, figs. A–F.

Stem erect, cano-pubescent, longitudinally striate. *Stipules* lanceolate, subacuminate, *Leaves* trifoliolate, subsessile or petiole very short, terminal leaflets obovate or oblong-obovate; lateral leaflets unequalsided. *Racemes* longer than the leaves, many-flowered. *Peduncles* canescent-tomentose. *Flowers* yellow, the standard being striate with brown lines. *Calyx* hairy, segments lanceolate, two uppermost connate, 6–7 mm. long, distinctly shorter than the petals. *Standard* obovate glabrous, 10–12 mm. long; wings spurred unguiculate; carina boat-shaped, apex obtuse, base unguiculate. *Pod* 18–20 mm. long, glabrous, pointed, seeds black, reniform, 6 mm. long.

Natal.—Inanda, *Wood* No. 1884, *Rehmann* No. 8411, *Wood* No. 6627.

An easily recognized shrub with obovate terminal leaflets, racemes longer than the leaves, and yellow flowers, the *standard* being striate with brown lines.

Series 40.—*Leaves silky-silvery or cinereous pubescent. Flowers* 8–12 *mm. long, in long racemes longer than the leaves.*

55. **R. albissima,** Gandoger in "Bull. Soc. Bot., France," LX, 461, 1913.

R. memnonia, Harvey pro-parte ; Wood, "Natal Plants," t. 349.

Caulis rigidus, cano-tomentosus, longitudinaliter striatus. *Stipulae* lanceolatae, caducae. *Folia* trifoliolata petiolata, foliolis terminalibus rhombeo-obovatis, 2–3 cm. longis, 2–2·5 cm. latis, petiolulis terminalibus 6–8 mm. longis, foliolis lateralibus inaequilateralibus, petiolo communi saepissime, 15–20 mm. longis. *Racemi* axillares, folio longiores, multiflori. *Flores* penduli, 8–12 mm. longi. *Calyx* canescenti-tomentosus, 6–7 mm. longus, segmentis acuminatis. *Vexillum* extus pilis vestitum. *Carina* vexillo subaequilonga. *Legumen* canescenti-tomentosum, 12–15 mm. longum.

TRANSVAAL.—Magaliesberg, *Burke* ; near Aapies River, *Schlechter* No. 3619 ; Gezina, near Pretoria, *A. O. D. Mogg* No. 10082 ; above Aapies River, *Rehmann* No. 4374 ; Hartebeestpoort, *Miss Findlay* No. 21.

ZULULAND.—Ntondweni, *J. Wylie* (*Wood* No. 9197) ; Umsundusi, *Wood* No. 3954.

Easily recognized by the whole plant being tomentose-canescent ; the stems are rigid, the terminal leaflets rhombeo-obovate, the racemes longer than the leaves, many-flowered ; the flowers are yellow.

This is not *R. memnonia*, D.C.

Between Lourenco Marques and Komatipoort, *Bolus* No. 7751.

56. **R. Pegleri,** sp. nov.

Caulis strictus, virgatus, pubescens, longitudinaliter striatus. *Stipulae* angustae lineari-lanceolatae. *Folia* trifoliolata, foliolis terminalibus rhombeo-ovatis, 18–22 mm. longis et latis, punctatis foliolis lateralibus inaequilateralibus, petiolo pubescente, 14–25 mm. longo suffulta. *Racemi* densi multiflori, pedunculi folio longiores. *Flores* 10–11 mm. longi. *Calyx* in toto 9–10 mm. longus, pubescens, dentibus infimis, 7 mm. longis. *Vexillum* extus pubescens, in toto 10 mm. longum. *Carina* apice obtusa. *Ovarium* pilis vestitum. *Legumen* ignotum.

KENTANI.—Valleys, *Miss Alice Pegler* No. 156.

A plant allied in some respects to *R. adenodes*, from which it differs in its much thicker virgate stem. The standard is hairy externally. The calyx tube is 3 mm. long, the upper teeth 6 mm. long, the lower 7 mm.

Series 41.—*Leaves trifoliolate, leaflets narrow. Flowers solitary on peduncles longer than the leaves.*

57. **R. pauciflora,** Bolus in "Trans. S. Afr. Phil. Soc.," XVI, 383 (1906).

Suffrutex with virgate stems. *Stipules* small. *Leaves* trifoliolate, subsessile or shortly petiolate ; leaflets rigid, narrow, either linear-oblong or linear, margins distinctly revolute ; terminal leaflets 4–6 cm. long, 3–5 mm. broad, midrib below conspicuous. *Peduncles* longer than the leaves, bent just below the flower. *Calyx* lobes lanceolate, distinctly longer than the corolla, total length of calyx 15–16 mm. *Petals* 10–12 mm. long ; keel boat-shaped ; standard glabrous. *Ovary* hairy. *Pod* 3·5–4 cm. long, apiculate.

SWAZILAND.—*Burtt-Davy* No. 2825. TRANSVAAL.—Spitskop, *R. Pott* No. 5062.

A virgate shrub with trifoliolate leaves and narrow rigid leaflets ; the peduncles are one-flowered and longer than the leaves, and the calyx is longer than the corolla.

Series 42.—*Leaves trifoliolate. Peduncles longer than leaves, few-flowered. Stem rigid or flexuous.*

58. **R. viscidula,** Steud., "Nom.," ed. 2, II, 254 ; Harvey, l.c. 252.

Copisma viscidulum, E. Mey., "Comm.," 134.

Stem fruticulose, rigid or subvoluble. *Stipules* lanceolate or ovate or subrotund, below glandulose-punctate, 8–11 mm. long, 10–18 mm. broad ; common petioles 10–22 mm. long ;

lateral leaflets unequalsided. *Racemes* longly peduncled, few-flowered. *Flowers* 10–12 mm. long; pedicels 3 mm. long. *Calyx* lobes longer than tubes. *Carina* boat-shaped, blunt. about 11 mm. long. *Pods* sessile, oblong, viscoso-pubescent.

NAMAQUALAND.—Khamiesberg. *W. Pearson*; Ceres Division, Koude Bockeveld, *R. Schlechter* No. 8875.

E. MEYER divides this species into :—

(*a*) *nemorale* magis volulile, foliolis majoribus tenuioribus subcordatis piloso-pubescentibus.

LITTLE NAMAQUALAND.—Kasparskloof, *Drège*.

(*b*) *campestrevix* voluble, foliolis minutis firmioribus subortundis sutomentose-pubescentibus.

LITTLE NAMAQUALAND.—Between Koussie and Garip, *Drège*.

59. **R. Schlechteri,** sp. nov.

Species ad *R. viscidulam*, Steud., valde accedens. *Caulis* flexuosus. *Stipulae* lanceolatae, acuminatae. *Folia* trifoliolata, petiolata, foliola terminalia ovata acuta, 12–15 mm. longa, 10–12 mm. lata, longiora quam lata, foliolis lateralibus ovato-lanceolatis, 10–16 mm. longis, 9-12 mm. latis, petiolulia terminalibus 5 mm. longis, petiolo communi 8–20 mm. longo suffulta. *Pedunculi* 2·6–6·5 cm. longi, pauciflori. *Flores* lutei, 10–12 mm. longi. ***Calycis tubus*** campanulatus, segmentis lineari-lanceolatis quam petala brevioribus. ***Vexillum*** glabrum. *Carina* obtusa, 11 mm. longa.

NAMAQUALAND,—Between Spektakel and Komaggas, *Bolus* No. 6559; Brachdamm, *Schlechter* No. 1115. A glandular plant.

Differs entirely from the preceding in the shape of the leaflets; the lateral leaflets are unequalsided, ovate, acute, 10–16 mm. long, 9–12 mm. broad.

IMPERFECTLY KNOWN SPECIES.

R. trichodes, Harvey, l.c. 258 (*Copisma trichodes*, E. Mey., "Comm.," 134).

Stem [procumbent, flexuous, very hairy, with patent yellow hairs. ***Leaflets*** elliptic-oblong, subacute, netted veined, yellow hairy on both sides, gland-dotted beneath, equalling the petiole. *Peduncles* one-flowered, equalling the leaf. *Legumes* unripe, straightish, villous.

CAPE.—*Drège*, no locality assigned.

The "Index Kewensis" refers this species to *R. Totta*, D.C.

R. nitida, Harvey, l.c. (*Copisma nitidum*, E. Mey., "Comm.," 136).

Stem terete, filiform, voluble, glabrescent. *Leaves* broadly triangular, lateral scarcely unequalsided, glabrous, and shining on both sides, ciliate. ***Racemes*** equalling the leaves, few-flowered. *Flowers* suberect, pedicels equalling the pubescent, nearly glandless calyx. *Pod* falcate, glabrescent, about three-seeded.

CAPE.—Grassy hills near Omsamculo, *Drège*.

If the description is correct, this cannot be a species of *Rhynchosia*, as the ovary in this genus only has two ovules.

EXCLUDED SPECIES.

R. Rehmanni, Schinz = *Fagelia bituminosa*, D.C.
R. ficifolia, Benth. = *Pueraria ficifolia*, C.B., Clarke.

THE GENERA ALOE AND MESEMBRYANTHEMUM

AS REPRESENTED IN THUNBERG'S HERBARIUM.

By N. E. Brown.

ALOE.

The Kew Herbarium having acquired, through the courtesy of Professor H. O. Juel, Director of Upsala Botanic Garden, the loan of the type specimens of the genera *Aloe* and *Mesembryanthemum* collected in South Africa by Thunberg, I have had the opportunity to carefully examine and compare them with the material at Kew, and have thought it would be useful to future workers upon these genera to give an account of the specimens and my identifications of them.

During my long career at Kew I have on several previous occasions had the privilege of being able to examine Thunberg's types of various orders and genera, and in all cases have made notes of my comparisons upon the sheets in the Kew Herbarium. In all the genera that I have previously examined Thunberg's material has usually been quite satisfactory and often excellent, but in the genus *Aloe* this is unfortunately not the case, for the specimens of most of the species consist of detached leaves and flower-stems, and in some instances the leaves and flowers of what are supposed to represent one species belong to two different species or even different genera. This is so unlike the usual excellence of Thunberg's specimens that it must be attributed to the succulent nature and often large size of the plants and the difficulty Thunberg must have had in properly making good, dried specimens of them while travelling as he did at that date. It seems evident that his specimens of detached leaves and flowers must have become mixed in the press, and that he sometimes forgot which leaves belonged to the flowers; hence, the mixture.

As I have very rarely found a locality written upon the sheet containing the specimen, Thunberg must have had some separate notes connecting the localities, as given in his "Flora Capensis," ed. Schultes, with the specimens.

From Professor Juel's account of Thunberg's Herbarium, it would appear that Thunberg brought his collection, or some part of it, to Europe mounted upon small sheets of thin paper, and remounted them on larger sheets of thicker paper after his return to Sweden. In doing this it is quite possible that some of the mixtures of species may have been made.

In the account of them which follows, the species have been arranged alphabetically under the names that Thunberg used in his "Flora Capensis," ed. Schultes, for convenience of reference; and for the sake of brevity I have quoted this work throughout as Thunb., "Fl. Cap."

ALOE, Linn.

A. arachnoides, Thunb., "Diss. Aloe," p. 7 (1785), and "Fl. Cap.," p. 311.

The specimen consists of three tufts of leaves and three racemes of flowers; all of the latter, I believe, are detached, but have been inserted among the leaves, and only that of the middle specimen can belong, as the other two flower-stems certainly belong to a different plant. The leaves belong to *Haworthia arachnoidea*, Duval, " Pl. Succ. Hort. Alenconia," p. 7 (1809) ; *H. arachnoides*, Haw., " Synop.," p. 96 (1812) ; *Aloe arachnoidea*, Miller, " Gard. Dict.," ed. 8, No. 17 (1768), as generally understood.

The locality given by Thunberg is Karroo near Zwartkops Zoutpan, in Uitenhage Division.

A. dichotoma, Thunb., " Fl. Cap.," p. 309.

The type specimen of this species consists of two short, longitudinal sections of the stem, one showing the very smooth bark and the other the interior fibre, and one leaf. It is the plant understood by this name, but the earliest publication of it is **Aloe dichotoma,** Masson in " Phil. Trans. Roy. Soc.," Lond. (1776), Vol. LXVI, Part I, p. 310, where the following description is given : " We found a new species of Aloe here (Masson and Thunberg were then, on 2nd November, 1774, ascending the Bokkeveld Mountains), called by the Dutch *Koker Boom*, of which the Hottentots make quivers to hold their arrows ; it being of a soft, fibrous consistence, which they can easily cut out, leaving only the bark, which is hard and durable. These trees were about 12 feet high, with a straight, smooth trunk, about 10 inches or a foot (in) diamater and 5 or 6 feet in length, which divided into two branches, and those were again sub-divided into two more branches, which terminated in a bunch of thick, succulent leaves surrounding the stem, spear-shaped, entire, without spines, and hanging down like the leaves of *Dracaena draco*. We did not see it in flower, but by the above characters took it for a new species, and called it *Aloe dichotoma*." This name is usually quoted as having been given by Linnaeus fil., " Suppl.," p. 206, but that work was not published until 1781, five years later than the publication of Masson's description, which is also a far better one than that of the younger Linné.

A. disticha, Thunb., " Diss. Aloe," p. 7 (1785), and " Fl. Cap.," p. 311, not of Linnaeus.

There are two sheets bearing this name, numbered 1 and 2. Both contain very good specimens of a new species of *Gasteria*, nearly allied to *G. verrucosa*, Haw., but differing from that species by the leaves being little more than half as broad at the base, with more parallel sides and more acute and somewhat spine-pointed at the apex, and with smaller and more prominent white tubercles than those of *G. verrucosa*. The following is a description of it :

Gasteria Thunbergii, N.E.Br.

Leaves strictly two-ranked, 3–7 inches long, 6–8 lines broad just above the sheath, and of nearly equal width to about 6–9 lines below the tip, where they taper sharply into a fine spine-like point. The surface on both sides and the margins are very rough from being thickly covered with small, white, very prominent tubercles. The *flower-stems* are detached, but probably belong to the leaves ; they are about 18 inches long, but were evidently longer, and are unbranched, 2½ lines thick. *Flowers* 7–9 lines apart. *Bracts* 3–4 lines long, reflexed, deltoid, acuminate, membranous. *Pedicels* 6–8 lines long, reflexed. *Perianth* (above its articulation with the pedicel) 11 lines long, curved, inflated at the lower part.

Thunberg does not give the locality of this species.

A. humilis, Thunb., " Diss. Aloe," p. 6 (1785), and " Fl. Cap.," p. 311.

This is *A. humilis*, Miller, " Abr. Gard. Dict.," ed. 6, No. 10 (1771).

The specimen consists of a small tuft of leaves and two good flowering stems. The sheet is labelled on the back as being from a plant cultivated in the Botanic Garden at Upsala.

A. lingua, Thunb., " Diss. Aloe," p. 8 (1785), and " Fl. Cap.," p. 312.

This is *A. plicatilis*, Miller, " Gard. Dict.," ed. 8, No. 7 (1768) ; *A. linguaeformis*, Linn. f., " Suppl.," p. 206 (1781), not of Miller.

The specimen consists of two leaves and two flowering stems. It was collected on mountains at Roode Zand, near Tulbagh Waterfall.

A. lingua, Thunb., is wrongly quoted by Baker in the "Fl. Cap.," Vol. VI, p. 291 (although omitted from the index), as being partly *Gasteria disticha*, whilst *A. linguaeformis*, Linn. f., is not quoted at all, no attention having been paid to Haworth's correct statement in "Phil. Mag.," Nov. (1827), Vol. II, p. 353, that Thunberg's plant was *Rhipidodendrum distichum*, Willd. in "Ges. Naturf. Fr. Berl. Mag.," Vol. V, p. 165 (1811), which is a synonym of *Aloe plicatilis*.

A. maculata, Thunb., "Diss. Aloe," p. 8 (1785), and "Fl. Cap.," p. 311.

There are two sheets of this marked *α* and *β*.

Sheet *α* contains portions of two leaves and a raceme of what I believe to be **Gasteria pulchra,** Haw., "Synop.," p. 86 (1812).

Sheet *β* (which also has the name "*obliqua*, Haw.," written upon it in pencil) contains the apical half of some large and broad-leaved species of *Gasteria*, totally different from *G. pulchra*, which I cannot identify, and two inflorescences of some species of *Aloe* that are indeterminable.

Thunberg states that *A. maculata* grows on the Outeniqua Mountains, and often cultivated at Capetown, so that his specimens may have been partly obtained from both places.

A. perfoliata, Thunb., "Diss. Aloe," p. 5 (1785), and "Fl. Cap.," p. 310.

There are three sheets bearing this name, marked *α*, *β*, and *γ*.

Sheet *α* contains one leaf about 7 inches long and 2¾ inches broad, a tuft of four small leaves about 2½ inches long and 1 inch broad, and two single flowers. These fragments may really belong to three different species; it is not possible to name them with certainty.

Sheet *β* contains part of a leaf and two inflorescences, which I believe to belong to *A. latifolia*, Haw., "Synop.," p. 82 (1812).

Sheet *γ* contains part of a leaf and a flower-spike of *A. vera*, Linn., "Sp. Pl.," p. 320.

The locality given by Thunberg for *A. perfoliata* is the Karroo beyond Swellendam, on the sides of mountains. Sheet *γ*, however, is labelled on the back as having been sent from the West Indies by Forsström, where *A. vera* has been introduced from the Canaries.

A. picta, Thunb., "Diss. Aloe," p. 6 (1785), and "Fl. Cap.," p. 310.

This species is not represented by any specimen so named in Thunberg's Herbarium. He founded it upon *A. perfoliata*, vars. θ, λ, μ, ν, Linn., "Sp. Pl.," ed. 1, p. 320.

A. pumala, Thunb., "Diss. Aloe," p. 7 (1785), and "Fl. Cap.," p. 311.

There are two sheets so named, marked *α* and *β*.

Sheet *α* contains a tuft of leaves of *Haworthia fasciata*, Haw., "Suppl.," p. 57 (1819), on the left-hand side, and on the right-hand side a tuft of leaves of *Haworthia granata*, Haw., "Suppl.," p. 57 (1819). Each of these tufts has a flower-stem placed among them, but detached, which may or may not belong to the leaves; I am rather doubtful if they are properly placed.

Sheet *β* contains two leaves and a paniculately branched flowering-stem of what I believe to be *Haworthia margaritifera*, Haw., "Suppl.," p. 55 (1819), but the material is too poor to make the identification certain.

No locality is given for this species, but sheet *α* is labelled on the back as being from plants cultivated in Upsala Botanic Garden.

N.B.—*Aloe pumila*, Linn., "Sp. Pl.," ed. 1, p. 322, is likewise a mixture of two or three species of *Haworthia* with white tubercles, so that it is probable that at that date several species of this type were considered to be forms of one species.

A. retusa, Thunb., "Diss. Aloe," p. 10 (1785), and "Fl. Cap.," p. 311.

The specimen of this consists of part of a plant with two leaves and a flower-stem attached, five detached leaves, and a detached inflorescence, which all belong to **Haworthia retusa,** Duval, "Pl. Succ. Hort. Alenconio," p. 7 (1809), and Haw., "Synop.," p. 95 (1812); *Aloe retusa,* Linn., "Sp. Pl.," ed. 1, p. 322. No locality is mentioned by Thunberg for this species, but the specimen is labelled on the back of the sheet as being from a plant cultivated in Upsala Botanic Garden.

A. sinuata, Thunb., "Diss. Aloe," p. 6 (1785), and "Fl. Cap.," p. 311.

This name was founded by Thunberg upon the plant enumerated by Linnaeus in his "Species Plantarum," ed. 1, p. 320, and ed. 2, p. 458, as *A. perfoliata,* var. *ξ*, which is based upon "*Aloe succotrina angustifolia spinosa, flore purpurea,*" of Commelin, "Horti Medici Rariorum Plantarum," Vol. I, p. 94, t. 48 (1697). This plant of Commelin's is *Aloe succotrina,* Weston, "Universal Botanist and Nurseryman," Vol. I, p. 5 (1770), a book that seems to have been overlooked by all modern authors, yet it contains names that antedate some that have been credited to Lamark, whose first volume of his "Encyclopèdie" was not published until 1783, or thirteen years later than Weston's book.

No specimen exists in Thunberg's Herbarium bearing the name *A. sinuata,* but there is a sheet bearing the name *A. succotrina* in Thunberg's handwriting, which Professor Juel, in his "Plantae Thunbergianae," p. 119, seems to have considered to represent *A. sinuata,* Thunb. This sheet, however, contains (*a*) part of a leaf of *Aloe fruticosa,* Lam., (*b*) part of a leaf of *Aloe spicata,* Thunb., and (*c*) part of a raceme of flowers of some species of *Aloe* that is quite indeterminable, but most certainly does not belong to either species represented by leaves upon that sheet.

So that if *A. sinuata,* Thunb., is considered to be founded upon *A. perfoliata,* var. *ξ* of Linnaeus, it must be placed as a synonym of *A. succotrina,* Weston. But if it is held to be founded upon the sheet bearing the name *A. succotrina* in Thunberg's Herbarium, then the name *A. sinuata* must disappear altogether.

In the synonymy that Thunberg gives under *A. sinuata,* he quotes "*Aloe barbadensis mitior, laete virens et splendens,*" Dill., "Hort. Elth.," p. 23, t. 19, f. 24." The figure should be 21, not 24. This figure represents one of the American species of *Agave.*

Although *Aloe succotrina* is not mentioned by Thunberg in his "Prodromus" or "Floras," yet in his "Travels," English translation, ed. 3, Vol. I, p. 213, he mentions, under the date of 14th December, 1772, when at a farm near Slange River, in Oudtshoorn Division, that "Here we saw quickset hedges of *Aloe succotrina.*" What is this plant? Can it be a species distinct from *Aloe fruticosa*?

A. spicata, Linn. f., "Suppl.," p. 205 (1781); Thunb., "Fl. Cap.," p. 309.

Thunberg's specimen of this is the type of this species, and consists of portions of two leaves and six detached flowers. The leaves are respectively 10¾ and 13¾ inches long, and 14 and 16 lines wide at their basal ends, gradually tapering thence into a long and slender subulate point, which at 3 inches below the acute or bluntish tip is only 2 lines broad. The part of the leaf on the sheet named *A. succotrina* above-mentioned (under *A. sinuata*) is just 1 foot long and 14 lines broad at its basal end, and has just the same long, subulate apex. The teeth on the margins are 6–8 lines apart and very small, being not more than half a line long; the apical spine is also small. The margin between the spines is straight or very faintly concave. The flower-stem and pedicels are absent, but the flowers may have been sessile. One flower has what appears to be a bract attached to it, which is 6 lines long and 5 lines broad, and is broadly elliptic, obtuse, 3-nerved. The perianth is campulate in shape, 7 lines long and 5 lines in diameter as pressed, but is probably of nearly the same dimensions when alive. The segments are nearly 3 lines broad, ovate, oblong, obtuse, 3-nerved; they all appear to be free to the base, and are not ecurved at the apex. According to Thunberg they are white, with three green veins.

The stamens are exserted 3–4 lines beyond the tips of the perianth-segments, with stout, purple filaments half a line broad, but, according to Thunberg, the filaments are yellowish at the upper part and white at the base. He states that the flower is filled with a purple fluid, which, in the process of drying the specimen, may have stained the filaments, especially as I note that some of the perianth-segments are also tinted with purple. The style protrudes 3–4 lines beyond the stamens.

Thunberg states that this very distinct and hitherto unknown plant grows "in the interior regions, flowering in August"; and that it has a thick stem 3–4 feet high, bearing a crown of spreading leaves 2 feet long, and a very dense spike, a foot long, of crowded horizontally spreading flowers.

In the "Gardeners' Chronicle" (1921), Vol. LXX, p. 6, I gave an account of the history of *Aloe spicata* so far as known to me at the time, in which I detailed how I had vainly tried to get a clue from his travels to the locality where Thunberg found this plant, which still awaits rediscovery. There is nothing at all like it in the Kew Herbarium. I am now inclined to think that Thunberg may have seen the plant in cultivation in some garden at or near Capetown.

A. spiralis, Thunb., "Diss. Aloe," p. 9 (1785).

The sheet of this species in Thunberg's Herbarium contains a tuft of leaves of what I believe to be *Apicra spiralis*, Baker in "Jour. Linn. Soc.," Vol. XVIII, p. 217 (1880), and a detached inflorescence of some species of *Gasteria*, which is quite indeterminable.

No locality is mentioned by Thunberg for this species, and the specimen is from a plant cultivated in the Botanic Garden at Upsala.

I do not know if *Apicra spiralis*, Baker, is identical with *Apicra spiralis*, Willd., in "Ges. Naturf. Fr. Berl. Mag.," Vol. V, p. 273 (1811); it is a point that requires investigating.

A. variegata, Thunb., "Diss. Aloe," p. 9 (1785), and "Fl. Cap.," p. 312.

This is *A. variegata*, Linn., "Sp. Pl.," ed. 1, p. 327.

Thunberg's specimen consists of two leaves, with the variegation upon them well preserved, and a single flower. Thunberg does not mention a locality for it, and no information is given on the back of the sheet.

A. viscosa, Thunb., "Diss. Aloe," p. 9 (1785), and "Fl. Cap.," p. 312.

Thunberg's sheet of this species contains three flowering specimens. The central specimen, which I have marked (A) on the sheet, is larger than the others, and is *Haworthia viscosa*, Haw., "Synop.," p. 90 (1812). The lateral specimens, marked (B), may belong to a variety of *Haworthia viscosa*, Haw., or are possibly a distinct species allied to it. I have not seen any plant alive that is quite like them, so that living plants are required for their proper identification.

From the above account it will be seen that Thunberg's collection of the genus *Aloe* is rather a poor one in comparison with other genera in his Herbarium, as it contains little of interest except the type specimens of *Aloe spicata*, *A. dichotoma*, and the new species of *Gasteria* described above.

MESEMBRYANTHEMUM.

Thunberg's collection of this genus is a very interesting one and consists of 109 sheets of specimens, many of which are excellent, although often small, some are scrappy, and, as in the genus *Aloe*, in some instances there is a mixture of species either upon the same sheet or upon different sheets bearing the same name.

When Sonder was preparing his monograph of this genus for the "Flora Capensis," he had Thunberg's specimens to work with, but, upon examining them, I find that he has dealt with them in a most imperfect and unsatisfactory manner. In some cases he has wrongly identified Thunberg's plant with specimens collected by Zeyher in a totally different region, and described from Zeyher's plant, so that occasionally Thunberg's species is not described in the "Flora Capensis" at all. Added to this, Sonder has accepted the nomenclature of Salm Dyck's fine work on this genus as unimpeachable, whereas it is often entirely wrong, and therefore as the original descriptions of Thunberg and of Haworth are often entirely ignored and those of Salm Dyck, belonging to quite a different plant, substituted, much confusion of nomenclature has been made and the descriptions in the "Flora Capensis" are often quite untrustworthy. And as these errors have not been corrected by Berger in his monograph of the genus, since that work was chiefly compiled from the works of Salm Dyck and Sonder, there is really needed at the present time a carefully worked-out monograph of this very remarkable and highly interesting group of plants. This, as I have already stated in the "Journal of the Linnean Society of Botany," Vol. XLV, pp. 54–55, can only be properly and fully accomplished by a comparison with and study of the unique collection of original drawings of a large number of Haworth's types preserved at Kew.

In the process of comparison and identification of Thunberg's types with specimens in the Kew Herbarium, where Thunberg has mixed two or more species under one name, it has become necessary to take as being the plant he intended to bear the name that specimen which most accurately agrees with his description. As an example of this kind, *M. articulatum*, Thunb., may be cited. This name, as represented by his specimens, includes three distinct species, all very similar in general appearance, and upon a superficial examination they might easily be supposed to be one species, so that his description will apply fairly well to all of them, with the exception of the words "punctate-scabrid" as applied to the stem and calyx. As these words only apply to one of the specimens, neither of the others having this character, that particular specimen must be accepted as the type of *M. articulatum*, Thunb.

In the account of Thunberg's specimens which follows, the names are arranged in alphabetical order as they appear upon his sheets; and to the headline I have only given the reference to the well-known edition by Schultes of Thunberg's "Flora Capensis," published in 1823, other references being given under the determination of the specimens, except in those cases where Linnaeus or Linnaeus fil. is the author, as these, of course, take precedence over the names of Thunberg, Aiton, or Haworth. Thunberg gives no authority for the name on the sheets.

For the localities mentioned by Thunberg, I have used the modern form of spelling. Many of his more interesting species were collected in the Van Rhynsdorp and Calvinia Divisions, in the Karroo between the Olifants River and the Bokkeveld Mountains, and on or near Hantam Mountains.

The following is an explanatory list of the abbreviations used for the books quoted :—

Ait., "Hort. Kew."	W. Aiton, "Hortus Kewensis," ed. 1, Vol. II (1789)
Berger, "Mesemb."	A. Berger, "Mesembryanthemem and Portulacaceen" (1908).
"Bot. Mag."	"Botanical Magazine."
D. C., "Plant Grass"	A. P. de Candolle, "Histoire des Plantes Grasses" (1799–1829).
Eckl. & Zeyh., "Enum."	C. F. Ecklon & K. Zeyher, "Enumeratie Plantarum Africae Australis Extratropicae" (1834–37).
Haw., "Misc."	A. H. Haworth, "Miscellanea Naturalia" (1803).
Haw., "Obs."	A. H. Haworth, "Observations on the genus Mesembryanthemum," Part II (1795). *N.B.*—Part I was published in 1794, but does not contain any descriptions of species, only introductory matter.
Haw., "Rev."	A. H. Haworth, "Revisiones Plantarum Succulentarum" (1821).
Haw., "Suppl."	A. H. Haworth, "Supplementarum Plantarum Succulentarum" (1819).
Haw., "Synop."	A. H. Haworth, "Synopsis Plantarum Succulentarum" (1812).

Houtt., "Handl."	M. Houttuyn, "Handleiding tot de Plant- en Kruidkunde," Vol. IX (1778).
Houtt., "Nat. Hist."	M. Houttuyn, "Natuurlyke Historie of uitvoerige Beschryving der Dieren, Planten en Mineraalen," Deel II (1773–83).
Jacq., "Hort. Schoenbr."	N. J. Jacquin, "Plantarum rariorum Horti Caesarei Schoenbrunnensis" (1797–1804).
Jacq., "Hort. Vind."	N. J. Jacquin, "Hortus Botanicus Vindobonensis" (1770–76).
Lam., "Encyc."	Chevalier Lamarck, "Encyclopédie Methodique," Vol. I–IV (1783–97).
Linn., "Sp. Pl."	C. Linnaeus, "Species Plantarum," ed. 1 (1753).
Linn. f., "Suppl."	C. von Linne, "Supplementarum Plantarum Systematis Vegetabilium (editionis decimae tertiae), Generum Plantarum (editionis sextae), et Specierum Plantarum (editionis secundae)" (1781).
"Nov. Act. Acad. Leop.-Car. Ephem."	Nova Acta Physico-Medica Academiae Caesareae Leopoldino-Carolinae Naturae Curiosorum exhibentia Ephemerides," Vol. VIII, Appendix (1791). *N.B.*—Twenty-one species of *Mesembrianthemum* are described in this rare book.
Salm Dyck, "Mesemb."	J. Salm-Reifferscheid-Dyck, "Monographia generum Aloes et Mesembryanthemi" (1836–63).
Sond., "Fl. Cap."	O. W. Sonder in Harvey & Sonder, "Flora Capensis," Vol. II (1861–62).
Thunb., "Fl. Cap."	C. P. Thunberg, "Flora Capensis," ed. Schultes (1823).
Thunb., "Mus. Nat. Acad. Upsal."	C. P. Thunberg, "Museum Naturalium Academiae Upsaliensis," Auctum, Part II (1827).
Thunb., "Prod."	C. P. Thunberg, "Prodromus Plantarum Capensium," Part II (1800).
Willd., "Enum. Hort. Berol."	C. L. Willdenow, "Enumeratio Plantarum Horti Regii Botanici Berolinensis" (1809); Supplementum (1813).
Willd., "Hort. Berol."	C. L. Willdenow, "Hortus Berolinensis" (1803-16).
Willd., "Sp. Pl."	C. L. Willdenow, "Species Plantarum," Vol. II (1799).

MESEMBRYANTHEMUM, L.

M. acinaciforme, Thunb., "Fl. Cap.," p. 422.

This name appears in both Thunberg's "Prodromus" and his "Flora," but no specimen exists in his Herbarium representing that name as used by him. There is, however, a specimen named "*M. forficatum*" by Thunberg, which is the true *M. acinaciforme*, Linn., and that name is also written upon the sheet as "*acinaciforme*, Mus."

M. albidum, Thunb., "Fl. Cap.," p. 423.

The specimen consists of two well-preserved flowering branches of *M. albidum*, L. The locality of this species is not mentioned.

M. angulatum, Thunb., "Fl. Cap.," p. 426.

There are three sheets of this, marked α, β, and γ. They all belong to the same species, viz. :—

M. Aitonis, Jacq., "Hort. Vind.," Vol. III, p. 8, t. 7 (1776).

M. angulatum, Thunb., "Prodr.," p. 91 (1800).

M. crystallophanes, Eckl. & Zeyher, "Enum. Pl. Afr. Austr.," p. 322 (1836), and Salm Dyck, "Mesemb.," § 60, fig. 2.

Thunberg collected this near the Sundays River in Uitenhage Division, and his specimens are identical with those of MacOwan, "Herb. Austr. Afr." (1873) from near Grahamstown. It is somewhat remarkable that this very distinct plant has not previously been identified with Jacquin's excellent figure.

Thunberg describes the branches as opposite, and they are so on the lower part of the specimen on sheet *a*, but on the upper part of that specimen, and on that on sheet *β*, they are alternate, just as they are on MacOwan (1873).

Sonder in "Fl. Cap.," Vol. II, p. 454, quotes the specimen on sheet *γ* as being "*M. angulatum*, var. *gracile*," but it is merely a small lateral branch 2 inches long, broken from a larger specimen, and very possibly from one of those on sheet *a* or *β*. The Bethelsdorp specimen which Sonder also quotes for his variety *gracile*, and from which he doubtless described, is probably a different plant. Jacquin raised *M. Aitonis* from seeds sent to him by Aiton, so that in all probability they were collected and sent to Aiton by Masson, who accompanied Thunberg on his journeys.

M. apetalum, Thunb., "Fl. Cap.," p. 417.

This is represented in Thunberg's Herbarium by a scrap about 3 inches long, being evidently a short branch from an annual, but it is undoubtedly:

M. apetalum, Linn. f., "Suppl.," p. 258 (1781); *M. copticum*, Jacq., "Hort. Vind.," Vol. III, p. 7, t. 6 (1776), not of Linnaeus.

M. apetalum was described from a plant cultivated in Upsala Botanic Garden, doubtless raised from seeds supplied by Thunberg. As no specimen exists in the Herbarium of the younger Linné, that in Thunberg's Herbarium must be accepted as the type of the species. It quite agrees with the description of Linnaeus fil., but I cannot match it with any specimen at Kew. It and *M. papulosum*, Linn. fil., are evidently allied species, and require to be searched for and made better known. To this end I here give a translation of the description of *M. apetalum*, Linn. fil., with details concerning Thunberg's specimen included.

The plant is an annual. Stems or branches 1–2 inches long, prostrate, terete, reddish, covered with glittering papillae, as is the whole plant. The branch of Thunberg's specimen including leaves, is 3 inches long and $\frac{3}{4}$ line thick, and glabrous; the papillae have all shrunk and disappeared from the whole of the specimen except on one pedicel, where they are very evident and rather large, but, under a strong lens, in one or two places evidence that the leaves were also papillate can just be traced. Leaves opposite, about $1\frac{1}{2}$–2 inches long and 1–2 lines broad, linear, or, according to Linnaeus fil., slightly lanceolate, obtuse, succulent, channelled above, convex and somewhat roughly papillate beneath, glabrous. Pedicels $\frac{1}{2}$–1 inch long, 1-flowered. As pressed, the flower has the calyx-lobes and petals infolded upon the top of the ovary, and is about $3\frac{1}{2}$–4 lines in diameter. Calyx-lobes unequal, with subulate-cylindric tips. Petals 24, distant, very short, setaceous, white, resembling filaments without anthers, incumbent upon the top of the ovary. Stamens with filaments like the petals, but shorter; anthers fuscous. Ovary large, convex and smooth above. Stigmas 5, about $1\frac{1}{2}$ line long, erect in a column, with recurved tips.

This is evidently a remarkable and very interesting species, although with insignificant flowers. Any reader who may discover it would confer a favour if he or she would kindly send seeds of the plant to me, addressed to the Royal Botanic Gardens, Kew, or through Dr. Pole Evans or Mrs. Bolus.

Jacquin's figure of *M. copticum* seems so exactly to represent the plant of which Thunberg's specimen is only a single branch that I think there can be no doubt of their identity. Linnaeus fil. seems to have described the petals from flowers that had passed into the young fruiting stage, and become rolled up and "setaceous" and bent down upon the top of the ovary.

M. copticum of Linnaeus is a totally different plant and identical with *Aizoon hispanicum*, Linn.

M. articulatum, Thunb., "Fl. Cap.," p. 415.

There are two sheets bearing this name, marked 1 and 2, which contain three distinct species, all very similar in general appearance, and Thunberg's description will apply to all of them, with the exception of the words "punctato-scabri" and "punctato-scabridum" as applied to the stem and calyx. These words I interpret to mean, rough from being covered with raised points. The only specimen having this character is on the left-hand side of sheet 2 ; it seems to have been turned over when remounted, therefore the surface-structure is obscured by the adhesive matter upon it, so that the minute acute points or minute conical hairs can only be clearly seen on a few parts of the specimen, which has alternate branches, all directed to one side of the stem. Each branch ends in an oblique compound cyme composed of 3–6 branchlets bearing 1–3 flowers, and these branchlets are also directed to one side. The specimen seems to be from a growing plant just coming into flower; with apparently linear, half-terete, or perhaps channelled, acute leaves 2½–5 lines long.

The right-hand specimen on this same sheet has its branches placed at right-angles to each other, and they and the calyx were smooth when alive. But this smoothness is obscured on the dried specimen by minute, whitish blisters in places, caused by some secretion of lime or salt. The calyx seems also to be different in form from that of the right-hand scabrid specimen.

Sheet 1 contains two specimens, both alike, which differ from the specimens on sheet 2, by having the stems and calyx covered with blunt papillae (not points), which Thunberg in other cases of the same structure describes as "papilosis." The branches also differ from those of the scabrid plant in being placed at right-angles to each other. Therefore, as Thunberg's description of *M. articulatum* does not fully apply to any other than the left-hand specimen on sheet 2 bearing that name in his Herbarium, and especially as it well agrees with that specimen in the most important character he mentions, that specimen must be taken as being the type of that species, and its synonymy will be :—

M. articulatum, Thunb., in "Nov. Act. Acad. Leop.-Car. Ephem.," Vol. VIII, append., p. 10 (1791), and "Fl. Cap.," p. 415.

M. secundum, Thunb., "Mus. Nat. Acad. Upsal.," Part II, p. 12, name only (1827).

This specimen of *M. articulatum* seems to me to be the same plant as *M. secundum*, Thunb., which shows the scabrid character much more clearly. And I consider both to be the same species as Burke No. 468, from Dikkop Flats near the Fish River, in Albany Division, and Burke and Zeyher No. 705, which is probably from the same region. As Thunberg collected near the Fish River on the Uitenhage side of it, he may have obtained his specimen from that region. But the localities he gives for *M. articulatum* are "the Karroo near the Olifants River, towards the Bokkeveld Mountains, in Zwartland, and elsewhere." As none of his specimens have the locality attached to them, it is impossible to assign the particular locality to any of them.

The other two species under "*M. articulatum*" I am unable to identify, and consider it inadvisable to describe them from those specimens.

At the original place of publication four varieties are enumerated, and var. δ is described as "*major procumbens*" instead of "*minor procumbens*" as given in Thunberg's "Fl. Cap.," ed. Schultes.

Sonder in "Fl. Cap.," Vol. II, pp. 434 and 435, quotes *M. articulatum*, Thunb., as a synonym partly of *M. junceum*, Haw., and partly of *M. granulicaule*, Haw. These determinations are utterly wrong, for neither of Thunberg's specimens is like either *M. junceum* or *granulicaule* of Haworth, both of which have been completely misunderstood and wrongly described by Sonder, both being much more slender species than the plants mistaken for them by Sonder, and by Berger, who has mainly copied from Sonder and other works.

It may not be out of place to call attention to the fact that in consequence of Haworth's *M. junceum* being completely misunderstood, and because many of the species belonging to this group are very similar in appearance, at least half a dozen different species are to be found in Herbaria named *M. junceum*, not one of them, so far as I have seen, being correct.

M. aureum, Thunb., " Fl. Cap.," p. 425.

The type consists of one small specimen, collected on the Karroo, between the Olifants River and the Bokkeveld Mountains. As it is not the *M. aureum* of Linnaeus, Sonder renamed it :—

M. auratum, Sonder in " Fl. Cap.," Vol. II, p. 449.

M. aureum, Thunb. in " Nov. Act. Acad. Leop.-Car. Ephem.," Vol. VIII, Append., p. 16 (1791), not of Linnaeus.

It is evidently an erect shrub, with straight stems or main branches 1–1½ line thick, swollen at the nodes, with short, opposite, nearly erect or very ascending branchlets, that are densely papillate and of a pale biscuit colour as described by Sonder, but the main stem has a smooth, greyish-brown bark. Leaves opposite, 3–5 lines long and 1 line thick, obtuse or subacute, apparently subterete, channelled down the face and seemingly papillate; glabrous. Flowers solitary or 2–3 in a cyme at the ends of the branchlets. Pedicels 1–1½ line long, papillate. Calyx papillate : tube (ovary) obconic, about 5 lines in diameter in young fruit : lobes about 3 lines long, broadly ovate, with a blunt dorsal point below the apex of the membranous margin. Petals wanting on the specimen, but described by Thunberg as linear and yellow. He also states that the stigmas are 5, subulate, acute, and erect.

I have given the above description of Thunberg's type specimen because Sonder has evidently confused it with another species collected by Zeyher, from which he has partly described, since he gives as a character, " rudiments of old remaining leaves very spinous," which is not at all the case on Thunberg's specimen.

M. barbatum, Thunb., " Prodr.," p. 89, and " Fl. Cap.," p. 418.

One sheet containing three branches of—

M. barbatum, Linn., and of " Bot. Mag.," t. 70.

M. stelligerum, Haw., " Synop.," p. 278 (1812), and " Rev.," p. 190; Sond. in " Fl. Cap.," Vol. II, p. 447 ; excluding synonyms, not *M. stelligerum*, Haw. in " Phil. Mag.," (1824), Vol. LXIV, p. 61.

The modern monographers of this genus, Sonder and Berger, do not seem to have noted that Haworth, finding he had misunderstood the plant to which Linnaeus gave the name *M. barbatum* and had originally described that plant under the name of *M. stelligerum*, and another species under the name of *M. barbatum*, has corrected that error in the " Philosophical Magazine " (July, 1824), p. 61, where he transposes the two names, so that the correct synonymy for *M. barbatum*, Linn. is as given above, and for *M. stelligerum* as follows :—

M. stelligerum, Haw., in " Phil. Mag." (1824), Vol. LXIV, p. 61, not of Haw., " Synop.," p. 278.

M. barbatum, Haw., " Synop.," p. 277 ; Sonder in " Fl. Cap.," Vol. II, p. 446, excluding synonyms ; not of Linnaeus nor of Berger.

The *M. barbatum*, Berger, " Mesemb.," p. 80, on account of its having acute papillae is certainly neither *M. barbatum*, Linn., nor *M. stelligerum*, Haw., both of which have blunt papillae. It is possibly *M. intonsum*, Haw. I do not know what *M. stelligerum*, Berger, " Mesemb.," p. 82, may be, but from the more numerous bristles described as present at the apex of the leaf, it is probably distinct from both *M. barbatum* and *M. stelligerum*, and is possibly a garden hybrid.

Thunberg states that *M. barbatum* grows upon Paardeberg, at Hantam, and elsewhere. But doubtless he confused two or more species in his mind, from seeing similar species in different localities.

M. bellidiflorum, Thunb., " Fl. Cap.," p. 418.

This seems to be represented by a sheet bearing the name " *M. bellidifolium* (?)," containing a single flower with two bracts at the base of its pedicel. It is quite indeterminable. No locality is mentioned for it.

M. bicolorum, Thunb., " Fl. Cap.," p. 427.

This is represented by a sheet labelled " *M. bicolor*," containing three short flowering branchlets from a plant cultivated in Upsala Botanic Garden, which seem to belong rather to *M. coccineum*, Haw., than to *M. bicolorum*, Linn.

M. bracteatum.

There are three sheets bearing this name, one of which has been named by Sonder, the others are respectively marked *α* and *β*. Sheet *α* contains four pieces of a plant cultivated in Upsala Botanic Garden, the others were collected in South Africa. This species is not enumerated in Thunberg's " Flora Capensis."

Sheets *α* and *β* contain specimens of—

M. mutabile, Haw., " Obs.," p. 377 (1795).

The other sheet is correctly named by Sonder—

M. bracteatum, Ait., " Hort. Kew.," ed. 1, Vol. II, p. 185.

M. calamiforme, Thunb., " Fl. Cap.," p. 417.

One small specimen, which is *M. calamiforme*, Linn. Thunberg does not mention a locality for it.

M. capillare, Thunb., " Fl. Cap.," p. 419.

There are two sheets bearing this name, marked *α* and *β*, and the specimens on each sheet are separately described by Thunberg as forms *α* and *β* of *M. capillare*.

Sheet *α* contains two specimens, which have been marked by Sonder " *α* " and " *β*." The right-hand specimen, marked " *β* " quite agrees with Thunberg's diagnosis of *M. capillare* and his description *α*. This plant is not *M. capillare*, Linn. f., but is—

M. brevifolium, Ait., " Hort. Kew.," ed 1, Vol. II, p. 188 (1789), and of Haw., "Obs.," p. 274 (1795), but not of Haworth's later works nor of other authors.*

M. capillare, Thunb. in " Nov. Act. Acad. Leop.-Car. Ephem.," Vol. VIII, Append., p. 13 (1791), and " Fl. Cap.," p. 419, as to description *α*, which is the only description given at the original place of publication, description *β* being absent from that work ; not of Linnaeus fil.

M. subglobosum, Haw., " Misc.," p. 62 (1803).

The specimen is a branch or portion of an erect glabrous shrublet, with the main stem about 1 line thick, and the branchlets about $\frac{1}{2}$ line thick, distinctly papillate. Leaves opposite, about $1\frac{1}{4}$–$1\frac{1}{2}$ line long and 1 line thick, somewhat subglobose or very shortly

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* I here wish to point out that *M. brevifolium* of Salm Dyck, of Sonder, and of Berger is a totally different plant from the *M. brevifolium*, Ait., differing from it by having longer leaves, which are not terete or subglobose, but flat above and keeled beneath, and has very different flowers. Its correct synonymy is—

M. erigeriflorum, Jacq., " Hort. Schoenbr.," Vol. IV, p. 39, t. 477 (1804).

M. lateriflorum, D. C., " Plant. Grass.," t. 164 (1828).

M. brevifolium, Salm Dyck, " Mesemb.," § 50, f. 4 (after 1836) ; Sonder, " Fl. Cap.," Vol. II, p. 342 ; and Berger, " Mesemb.," p. 95, not of Aiton, nor of Haworth.

This is only one example out of many of the confusion that has been made by later authors accepting as correct the names given by Salm Dyck, apparently without the slightest investigation.

In Haworth's time there were evidently two plants in cultivation under the name of *M. brevifolium*, neither of them being the same as *M. erigeriflorum*. In 1795, Haworth considered them to be forms of one species, but afterwards separated them.

One of them, as described by Haworth (" Obs.," p. 276), had leaves which " rarely measure a quarter of an inch," and were covered with rounded (not acutely pointed) papillae, or, as Haworth states, the papillae " were by no means pubescent." This plant was the true *M. brevifolium*, Ait. The other Haworth describes at first as *M. brevifolium* var. *longum*, and states that it has leaves up to $1\frac{1}{8}$ inch long, with " pubescent papulae which point downwards and looked in a microscope like minute hooks of glass or ice." This plant is quite unknown to me. In his " Synopsis " and later works Haworth retains this plant alone under the name *M. brevifolium*, and places the true *M. brevifolium*, Ait., as a synonym of *M. subglobosum*, Haw. But Aiton's name, being the older, must be retained, ellipsoid, papillate, but apparently with smaller papillae than those on the stem. Flowers solitary at the ends of the short branchlets. Pedicel 2½–3 lines long, slender. Calyx 5-lobed, papillate; tube (ovary) with a very distinct constriction under the base of the lobes and thereabout 1 line in diameter, and there is also a slight constriction at its base, where it joins the pedicel; lobes unequal, ½–1 line long, broadly ovate, obtuse. The other parts of the flower do not admit of examination, and the petals are destroyed. There are some better specimens of this plant at the British Museum, collected by Masson, who travelled with Thunberg. These have leaves 1–2 lines long, varying from subglobose to cylindric. The pedicels vary from 1–6 lines long, and the corolla appears to be about 9–10 lines in diameter, with petals about 4 lines long. The constrictions on the calyx-tube are not so distinct as on Thunberg's specimen.

Thunberg describes the flowers as minute and red. His specimen quite agrees with an original drawing of the typical *M. brevifolium*, Ait., at Kew. The peculiar constriction of the calyx-tube is a very marked feature of both Thunberg's specimen and the drawing of the type plant, in which the corolla is represented as being 8 lines in diameter, with apparently 25–30 acute purple petals.

M. brevifolium, Ait., and *M. sessile*, Thunb., are evidently allied species, although one is papillate and the other smooth.

The left-hand specimen, marked "*a.*" resembles *M. brevifolium*, but the branches spread more widely, the leaves are up to 4 lines long, and cylindric and covered with rounded papillae, and the pedicels 8 or more lines long. The calyx-tube below the lobes is also shorter, and the petals are only 2 lines long. It is doubtless the plant alluded to by Thunberg at the end of his description "*a.*" by the words "*Alia est hujus varietas: foliis magis teretibus, subpapulosis*" ("another, with more terete subpapulose leaves, is a variety of this"). I am not able to identify this specimen with any at Kew, nor is there any like it among those collected by Masson at the British Museum. It is quite distinct from *M. erigeriflorum*, having terete (not trigonous) leaves. More ample material is needed to determine whether it is a variety of *M. brevifolium* or a distinct species.

Thunberg collected these two specimens on hills near the Olifants River, towards the north, in Van Rhynsdorp Division.

Sheet *β* contains two specimens of a plant stated by Thunberg, under description *β*, to grow near the Gamtoos River, in the Humansdorp Division. It is totally different from the specimens on sheet *a* and is an exceedingly distinct species, differing from every other in the genus by its very slender filiform branchlets.

This plant is

M. capillare, Linn. f., "Suppl.," p. 260 (1781); Thunb., "Fl. Cap.," p. 419, as to description *β* only. (This description, nor any corresponding to it, does not occur under Thunberg's original description cited above under *M. brevifolium*.)

An irregularly much-branched shrublet, with very slender, woody branches and branchlets, the ultimate of which are filiform and scarcely a quarter of a line thick, thickened at the nodes in a somewhat bead-like manner, of a dark reddish-brown or chocolate colour (possibly purple when alive), smooth and shining on the older parts, but marked with minute white dots on the younger parts, the dots being minute dried-up papillae. The leaves have mostly fallen: those that remain are 1–2 lines long and less than half a line thick, and, according to Thunberg, slightly flattened above, obtuse, papillate. Pedicels solitary 3–6 lines long. The specimen is not in flower, and the few capsules upon it are damaged, but appear to be very shortly and broadly obconic, about 2 lines in diameter. Thunberg describes the flowers as being "minute, reddish, with reflexed sepals."

I do not match this plant with any specimen in the Kew Herbarium. The swollen nodes (resembling tiny oval beads) of its remarkably slender, brown branchlets distinguish it at once from all other species.

I find that there is no specimen of this plant in the Herbarium of Linnaeus fil. at the Linnean Society, so that, as in so many other cases, he undoubtedly described from Thunberg's specimens, which must be regarded as the type.

M. ciliatum, Thunb., "Fl. Cap.," p. 416.

One sheet of good specimens.

This plant has hitherto been included in the genus *Mesembryanthemum*, but its appearance is so distinctive that I expected it would differ in floral structure from that genus, and upon dissection I found this to be the case; for besides the very remarkable character of the ring of deflexed hairs at the base of the leaf-sheaths, I find the petals are united into a short tube at their base, the ovary is nearly superior, and the capsule of quite a different type from that of *Mesembryanthemum*. I therefore propose to found the genus TRICHOCYCLUS for its reception and that of two allied species, which will be described at the end of this account of Thunberg's species.

TRICHOCYCLUS, N.E.BR.

Dwarf bushy plants with erect succulent branches. Leaves opposite, united below into a short sheath, which is ciliate all around its very base with deflexed hairs, persistent. Calyx 5-lobed. Petals numerous, united into a short tube at the base. Stamens numerous, perigynous. Ovary nearly superior, with only a short basal portion immersed in the calyx-tube, 5 (–6 ?) -celled; stigmas 5 (–6 ?), subulate; ovules, few in each cell. Capsule 5 (–6 ?) -valved; valves sub-erect when open, wingless, and without expanding keels, but with a pair of erect, free, ovate, obtuse processes arising from their base within that close over the seeds and somewhat resemble valves of an inner capsule; they are probably the homologues of the cell-wings of the capsule of *Mesembryanthemum*. Seeds few in each cell, compressed. The name is derived from the Greek *Thrix*, a hair, and *Kyklos*, a circle, in allusion to the circle of deplexed hairs at the base of the leaf-sheaths.

T. CILIATUS, N.E.Br.—*Mesembryanthemum ciliatum*, Ait. "Hort. Kew," ed. 1, Vol. II, p. 179 (1789); Thunb. in "Nov. Act. Acad. Leop.-Car. Ephem.," Vol. VIII, Append., p. 11 (1791).

Collected between the Olifants River and Bokkeveld Mountains, in the Van Rhynsdorp Division.

This plant is identical with Pearson No. 3941, from south-west of Bitterfontein, in the same region.

M. corallinum, Thunb., "Fl. Cap.," p. 416.

One specimen in a flowerless condition. The original reference is—

M. corallinum, Thunb. in "Nov. Act. Acad. Leop.-Car. Ephem.," Vol. VIII, Append., p. 12 (1791).

A shrublet, hard and woody except at the young parts, much-branched, and apparently stout at the basal part, the lower part of Thunberg's type being 4 lines thick, the branches much less stout, and the branchlets rather less than 1 line thick, constricted at the nodes into short joints 2–3 lines long, glabrous, evidently smooth when alive. Leaves 2–3 lines long and about ¾ line broad and as much in thickness, subterete, slightly flattened above, obtuse or subacute, incurved-spreading, glabrous. According to Thunberg, the flowers are solitary and terminal at the apex of the branchlets, sessile. Calyx 5-lobed, green; lobes terete erect. Petals many, linear, spreading, white.

Thunberg states that this grows on dry hills near the Olifants River, towards the north, and in the Karroo below the Bokkeveld, and elsewhere.

I have not been able to match this with any specimen in the Kew Herbarium, but there is a larger specimen of it in the British Museum, collected by Masson when travelling with Thunberg.

M. cordifolium, Thunb., "Fl. Cap.," p. 417.

One sheet of this plant, collected in a wood near Zeekoe River, in the Humansdorp Division. It is—

M. cordifolium, Linn. f., "Suppl.," p 260 (1781), and is identical with Zeyher No. 2621.

M. crassifolium, Thunb., "Fl. Cap.," p. 421.

There is one sheet of this containing two specimens, for which Thunberg gives the locality: hills in Zwartland, Malmesbury Division. These specimens belong to—

M. filicaule, Haw., "Misc.," p. 87 (1803).

M. crassifolium, Thunb., "Prodr.," p. 90 (1800), not of Linnaeus.

Thunberg's specimens are identical with MacOwan, "Herb. Aust.-Afr." (1731), from the foot of Devil's Peak.

Sonder in "Fl. Cap.," Vol. II, p. 407, refers *M. crassifolium*, Thunb., to *M. reptans*, Ait., but that is a very different species, with larger, prominently dotted (not smooth) leaves and much larger yellow or white (not rosy) flowers.

M. debile, Haw., also placed by Sonder as a synonym of *M. reptans*, Ait., is likewise totally distinct from the latter, and I believe it to be the plant distributed by Schlechter under No. 9241 as *M. filicaule* (which it certainly is not) from French Hoek.

M. criniflorum, Thunb., "Fl. Cap.," p. 411.

One sheet containing four good specimens, collected on sandhills near Capetown. These specimens agree with those of MacOwan, "Herb. Austr.-Afr." (1745), from near Sea Point. Their correct synonymy is—

M. criniflorum, Linn. f., "Suppl.," p. 259 (1781); Thunb., "Prodr.," p. 88 (1800).

M. limpidum, Ait., "Hort. Kew.," ed. 1, Vol. II, p. 182 (1789).

M. spathulatum, Willd., "Sp. Pl.," Vol. II, p. 1025 (1799), not of Thunberg.

M. tricolor, Willd., "Hort. Berol.," Vol. I, p. 22, t. 22 (1803), not of other authors.

(*N.B.* Willdenow's work was issued in parts so that the date 1816 on the title-page is very misleading, that being the date when Volume II was issued as a whole, but it was issued in parts previously.)

The colour of the flower varies.

Sonder and Berger have erroneously quoted *M. tricolor*, Willd., as belonging to *M. pyropaeum*, Haw. They also erroneously quote Houttuyn as being the author of *M. criniflorum*, whilst Thunberg ("Fl. Cap.," p. 411) attributes the name "*M. capense*" to Houttuyn, but neither of these names are to be found at the place quoted in Houttuyn's work; the plant referred to being *M. pugioniforme*, Houtt., "Nat. Hist.," Deel II, t. 53, separately issued as Handleid., "Planten tot de Kruidkunde" Vol. IX, p. 32, t. 53, which represents a form of *M. pomeridianum*, Linn., in fruit, with capsules having 16–20 valves and cells, whilst *M. criniflorum* has only 5 valves and cells to its capsules. But authors have paid little heed to fruit-characters in this genus.

M. crystallinum, Thunb., "Fl. Cap.," p. 413.

There are two sheets of this, containing specimens that appear to be *M. crystallinum*, Linn. The locality given for it by Thunberg is near the Sundays River, but sheet 1 is labelled as being from a plant cultivated in Upsala Botanic Garden.

M. decussatum, Thunb., "Fl. Cap.," p. 414.

One sheet with two specimens upon it collected on dry hills near the Olifants River, towards the north, in the Karroo below the Bokkeveld. Its synonymy is—

M. brachiatum, Ait., "Hort. Kew.," ed. 1, Vol. II, p. 191 (1789), and Haw., "Misc.," p. 58.

M. decussatum, Thunb., "Prodr.," p. 88 (1800).

This is the same plant as Pearson No. 5544, which has been erroneously distributed as *M. geniculiflorum*, Linn., from north of Nieuwerust, in the Van Rhynsdorp Division, which at Kew is represented by a small and very poor specimen that has been grazed by sheep or cattle, but is undoubtedly the same plant as *M. decussatum*, Thunb.

M. deltoides, Thunb., "Fl. Cap.," p. 418.

One sheet with two good branches upon it of *M. deltoides*, Linn., from the mountains of Roodezand Kloof, now New Kloof, near Tulbagh.

M. difforme, Thunb., "Fl. Cap.," p. 423.

One specimen, in unripe fruit. This is a small plant scarcely an inch high, and quite different from *M. difforme*, Linn., as I have elsewhere pointed out, its synonymy being—

M. exiguum, N.E.Br., in "Journ. Linn. Soc. Bot.," Vol. XLV, p. 102 (1920).
M. difforme, Thunb., "Prodr.," p. 90 (1800), not of Linnaeus.

It seems to belong to the same group as *M. rostratum*, Linn. The specimen has a woody root stock bearing a tuft of four growths. Each growth (including flower) is 8–9 lines long and about 4 lines in diameter, with three pairs of leaves. The basal pair are 6 lines long and 1–1½ line broad (the dimensions here given are doubtless much less than those of the living plant), widely spreading, united at the base into a sheath only 1½ line long: they appear to be concave above, very rounded on the back, with a keel at the apex, which is truncate in side view, and has a minute point, glabrous, but covered with minute hard papillae or granules. The second pair are erect and united at the base into a cylindric sheath 4½–5 lines long, with two compressed, acute leaf tips 2 lines long, papillate like the lower leaves and keeled down the back; the sheath in the dried specimen is thin, somewhat membranous, and whitish. Within this sheath the third pair of leaves is enclosed, which appear to be free nearly to the base and just like the basal pair, but they are erect, with their upper surfaces pressed together. They probably ultimately spread widely and become in turn a basal pair. Pedicel 4–5 lines long, with a pair of small leaf-like bracts at its base. This bears a nearly ripe capsule, no flower being present on the specimen. Calyx apparently 5-lobed to the top of the ovary; lobes 2–2½ lines long, some leaf-like, keeled and minutely tuberculate or papillate, the others broadly ovate, with membranous margins. Petals numerous, their shrivelled remains about 5 lines long when wetted. Stigmas 5, about 1½ line long, subulate, recurved-spreading.

Sonder, in the "Flora Capensis," quotes this very distinct species on p. 395 as being a synonym of *M. denticulatum*, Haw., and on p. 399 as a synonym of *M. namaquense*, Sond. The former is a totally different plant, and the latter I have not seen, but it is described as having leaves 3 lines broad and a "peduncle three to four times longer than the leaves." So that it is evident that Thunberg's plant is different from both.

M. digitiforme, Thunb., "Fl. Cap.," p. 412.

One sheet, with two perfect growths and two flowers upon it. Collected in the Karroo between Olifants River and the Bokkeveld Mountains, in the Van Rhynsdorp Division. It is—

M. digitatum, Ait., "Hort. Kew.," ed. 1, Vol. II, p. 181 (1789).
M. digitiforme, Thunb., in "Acad. Leop.-Car. Ephem.," Vol. VIII, Append., p. 6 (1791)

M. dolabriforme, Thunb., "Fl. Cap.," p. 424.

Two sheets marked 1 and 2.

Sheet 1 contains a specimen of some stemless species in fruit, with two leaves. It is unknown to me, and probably new, but quite indeterminable.

Sheet 2 contains a flowering branch and a separate flower of *M. dolabriforme*, Linn.

The locality given by Thunberg is "on very dry hills at Hantam, near the Roggeveld Mountains."

M. edule, Thunb., "Fl. Cap.," p. 426.

One sheet, containing two flowering branches. Thunberg states that this plant, which is *M. edule*, Linn., grows near Capetown, Zwartland, and elsewhere.

M. emarcidum, Thunb., "Fl. Cap.," p. 415.

Two sheets, marked 1 and 2, stated to have been collected on the Bokkeveld and elsewhere in the Karroo.

Sheet 1 contains two species, a branch (which I have marked "A" on the sheet), and four pieces (which I have marked "B").

"A" is the plant described by Thunberg as *M. emarcidum*, Thunb., in "Nov. Act. Acad. Leop.-Car. Ephem.," Vol. VIII, Append., p. 9 (1791); *M. anatomicum*, Haw., "Misc.," p. 50 (1803).

This specimen appears to me to be the same as Pearson No. 6434, from Khoms Ravine, in the Khamiesberg. At the original place of publication, Thunberg states that this species has 4 erect stigmas, and grows in the Bokkeveld mountain region, without mention of any other locality. There is a good specimen of it at the British Museum, collected by Masson when travelling with Thunberg.

"B" is *M. expansum*, Linn.

Sheet 2 contains one good specimen of *M. expansum*, Linn.

M. emarginatum, Thunb., "Fl. Cap.," p. 421.

One specimen from Upsala Botanic Garden. The specimen is a poor one, but probably is *M. emarginatum*, Linn.

M. expansum, Thunb., "Fl. Cap.," p. 415.

Two sheets marked 1 and 2. Sheet 1 contains a very fine flowering specimen from Upsala Botanic Garden and sheet 2 a good specimen in fruit. The locality given for this species is near Dutoits Kloof. Both specimens are

M. tripolium, Linn.

M. expansum, Thunb., "Prodr.," p. 88 (1800), not of Linnaeus.

Thunberg's specimens agree with those of Bolus No. 7930, from Orange Kloof on Table Mountain.

M. falcatum, Thunb., "Fl. Cap.," p. 422.

One specimen. No locality is quoted for it. The plant is *M. lacerum*, Haw., "Obs.," p. 383 (1795); *M. falcatum*, Thunb., "Prodr.," p. 90 (1800), not of Linnaeus.

M. fasciculatum, Thunb., "Fl. Cap.," p. 417.

One specimen, collected near Sundays River, in the Uitenhage Division.

This species has been wrongly quoted by Sonder in "Fl. Cap.," Vol. II, p. 432, as a synonym of *M. tetragonum* Thunb., which is an utterly different plant of erect bushy habit, whilst *M. fasciculatum* is prostrate.

I have been unable to match *M. fasciculatum*, Thunb., with any specimen in the Kew Herbarium, but it is evidently allied to *M. crassifolium*, Linn., which grows in the region of Capetown (Wolley Dod No. 1625), and is probably the eastern representative of that species, but seems to root much more freely at the nodes than *M. crassifolium* does. The following is a description of Thunberg's plant :—

M. fasciculatum, Thunb., in "Nov. Act. Acad. Leop.-Car. Ephem.," Vol. VIII, Append., p. 11 (1791).

Stem prostrate, rooting at the nodes, about $1\frac{1}{2}$ line thick, with arching internodes $1\frac{1}{2}$–2 inches long, glabrous, smooth, of a pale biscuit colour, bearing at the nodes short, erect, leafy-flowering shoots 1–2 inches high, including the flower, each with 4–5 pairs of crowded ascending-spreading leaves 6–7 lines long and 1 line thick, which appear to have been nearly terete and very obtuse at the apex, and are described by Thunberg as "scarcely trigonous." Like some other species from the same region, the dried leaves have numerous dot-like blisters formed by crystalline particles of some salt or lime. Pedicel terminal, solitary, bractless, about 5 lines long. Calyx 4-lobed, according to Thunberg, but the lobes cannot be properly seen on the specimen. The flower seems to be in a closed condition, and measures about 5 lines from the base of the calyx to the tips of the apparently lax petals, which are white, according to Thunberg.

M. fastigiatum, Thunb., "Fl. Cap.," p. 413.

One sheet containing two good specimens, collected on very dry hills near the Olifants River, towards the north, in the Van Rhynsdorp Division.

De Candolle, and following him Sonder, and Berger have maintained the name *M. fastigiatum,* Haw., which was published in 1795, and given to the four-years older *M. fastigiatum,* Thunb. the new name of *M. papuliferum,* even overlooking the fact that Haworth had also long before bestowed a new name upon it. Thunberg's name, however, must be maintained, and as no good description of the plant exists, the following is an account of Thunberg's type specimens :—

M. fastigiatum, Thunb., in "Nov. Act. Acad. Leop.-Car. Ephem.," Vol. VIII, Append., p. 7 (1791).

M. erectum, Haw., "Misc. Nat.," p. 53 (1803).

M. papuliferum, D. C., "Prodr.," Vol. III, p. 448 (1828).

An annual 1½–2½ inches high, and as dried, broadly obconic in outline and 2–3 inches in diameter across the flat top, densely covered with watery papillae on stems, leaves, and calyx. One specimen is divided at the base into two, and the other into three main branches, each of which at about half an inch above the base is divided into two or three branches ½–¾ inch long : each of these either bear one to three flowers at the apex or divide once more before doing so, the whole forming a flat-topped cyme. All the branches thicken upwards in an obconic manner. The leaves have disappeared from the lower nodes, and the few that remain are much shrivelled, 5–7 lines long and 1 line thick ; they seem to have been nearly terete, or perhaps more or less flattened above, obtusely rounded at the apex. The flowers seem to be nearly sessile or but shortly pedicellate. Their structure I have not examined, but Thunberg describes the calyx as 5-lobed ; the lobes as being ovate, obtuse, purple, and the corolla is snow-white.

I find that there are much larger specimens of this plant at the British Museum, collected by Masson.

The plant later described as *M. fastigiatum,* by Haworth, requires to have a new name ; therefore, I propose for it that of—

M. plenifolium, N.E.Br.

M. fastigiatum, Haw., "Obs.," p. 210 (1795), not of Thunberg.

M. filiforme, Thunb., "Fl. Cap.," p. 417.

One specimen, collected at Hantam.

This plant is not a *Mesembryanthemum,* but is a species of *Galenia,* and may therefore bear the following name :

Galenia filiformis, N.E.Br.

Mesembryanthemum filiforme, Thunb., "Prodr.," p. 89 (1800), and "Fl. Cap.," p. 417.

Aizoon microphyllum, Bartl., in "Linnaea," Vol. VII, p. 541 (1832).

This plant was left undetermined by Sonder, and it seems to be distinct from *Galenia herniariaefolia,* Fenzl., under which Sonder places *Aizoon microphyllum* as a synonym. It was evidently covered with minute watery papillae when alive, and the shrunk cells in some places have somewhat the appearance of pubescence, but I do not perceive any real hairs upon this or on *G. herniariaefolia,* such as Sonder mentions in his Key to the species of *Galenia.*

M. forficatum, Thunb., "Fl. Cap.," p. 422.

The specimen representing this is—

M. acinaciforme, Linn.

M. forficatum, Thunb., "Prodr.," p. 90 (1800), not of Linnaeus.

It was collected on the Karroo.

M. geniculiflorum, Thunb., "Fl. Cap." p. 414.

The specimen of this is the true *M. geniculiflorum,* Linn., and is labelled "*culta in horto gryphico.*" It is identical with Bolus No. 9236, from near the Montagu Baths.

M. glaucum, Thunb., "Fl. Cap.," p. 427.

One sheet containing two specimens. The locality is not mentioned by Thunberg. The right-hand specimen may possibly be *M. glaucum,* Linn., but the flower is detached. The left-hand specimen is *M. roseum,* Willd., "Enum. Plant. Hort. Berol.," p. 535 (1809).

M. hispidum, Thunb., "Fl. Cap.," p. 418.

There are five sheets so named, marked α, β, γ, δ, and ε, of which Thunberg gives separate descriptions under letters α, β, and γ, which presumably correspond with his sheets so lettered. He evidently regarded them as forms of one species.

Sheet α contains a good specimen of *M. candens,* Haw., "Rev.," p. 186 (1821). It is stated to grow on sandy plains, and is identical with Zeyher No. 2592, from near Port Elizabeth.

Sheet β contains two branches of *M. calycinum,* Haw., "Rev.," p. 187 (1821). It is the plant described by Thunberg under β, for which he gives no locality, but it is the same plant as Bolus No. 5050, from near Mitchell's Pass.

Sheet γ contains one poor specimen of *M. micans,* Linn. It may be the plant described by Thunberg under γ, but scarcely agrees with the description. The locality given for γ is Karroo between Olifants River and the Bokkeveld Mountains, in the Van Rhynsdorp Division.

Sheet δ is named "*M. hispidum* (?)." It is an undescribed species, unlocalized by Thunberg, but identical with a branch mixed with another species collected by Bolus near the Montagu Baths, and distributed under No. 6715, which I describe under the following name :—

M. praecultum, N.E.Br.

An erect bushily-branched shrub, probably less than a foot high, the specimen seen being about 6 inches high, with the stoutest part of the stem less than 1 line thick. The young parts, including leaves and calyx, densely papillate, the old parts with a somewhat smooth greyish or brown bark. Internodes 3–6 lines long. Leaves opposite, 1–2 lines long, subglobose or nearly as thick as long, or shortly cylindric, very obtuse ; most of them have fallen from the specimens. Flowers very numerous, produced all along the main and lateral branches at nearly every node, solitary in the axil of each fallen leaf. Pedicel ascending, 3–5 lines long. Calyx 5-lobed to the top of the ovary ; lobes subequal, nearly 2 lines long, oblong, obtuse. Petals numerous, about 3 lines long and ⅓–½ line broad, obtuse, tapering downwards. Stamens numerous. Stigmas 5, spreading, 1½ line long, slender, subulate, arising from a 5-lobed crown-like structure on the top of the ovary. Capsule 1½ line long and 2 lines broad, shortly and broadly obconic, convex at the top, 5-valved.

Sonder in "Fl. Cap.," p. 442, has referred *M. hispidum* (δ) of Thunberg's Herbarium to *M. brevifolium,* Ait., but that is a very different plant, with totally different and smaller flowers (see under *M. capillare*). The *M. brevifolium,* Sonder, is a mixture of three or more species.

Sheet ε contains two branches of what I believe to be *M. floribundum,* Haw., "Misc.," p. 100 (1803). It is not localized.

From the above it will be noted that neither of Thunberg's specimens belong to *M. hispidum*, Linn.

M. laeve, Thunb., "Fl. Cap.," p. 425.

One specimen, collected near Sundays River, in the Uitenhage Division. As the name *M. laeve* had previously been used by Aiton, Haworth changed the name to—

M. Thunbergii, Haw., "Misc.," p. 86 (1803).

M. laeve, Thunb., in "Acad. Leop.-Car. Ephem.," Vol. VIII, Append., p. 16 (1791), not of Aiton.

Thunberg's specimen agrees with those of Rogers No. 4656, collected near Zwartkops, in the Port Elizabeth Division.

This eastern plant is similar to and might be mistaken (in the dried state) for *M. dissimile*, N.E.Br., which grows near Capetown, but differs from that species by having more obtuse leaves, no bracts at the base of the pedicel, and apparently smaller flowers. But the two require to be compared when alive, so that their distinctive characters can be properly contrasted. The prostrate stems of *M. Thunbergii* are 2 lines thick, very smooth, and pale brownish.

M. lanceum, Thunb., "Fl. Cap.," p. 417.

One sheet, containing two good specimens. The locality is not stated. There is another specimen of it from Upsala Botanic Garden, named "*M. tripolium*," and also another mounted on the sheet of *M. ovatum* (which see). The original reference for it is *M. lanceum*, Thunb., "Prodr.," p. 89 (1800).

Sonder's description of this, in "Fl. Cap.," Vol. II, p. 455, is fairly correct, except that I believe the stems to be procumbent or straggling. Possibly the plant figured by De Candolle, "Plant. Grasses," t. 47, as *M. expansum*, may be *M. lanceum*, Thunb.; it does not seem to be *M. expansum*, Linn. It also seems closely allied to *M. varians*, Haw., and may prove to be that species when better known.

M. lineare, Thunb., "Fl. Cap.," p. 411.

One sheet of specimens, for which the localities Zwartland and Groenekloof, in the Malmesbury Division, are given. This plant is—

M. gramineum, Haw., "Obs.," p. 470 (1795).

M. lineare, Thunb., "Prodr.," p. 88 (1800).

M. pyropaeum, Haw., "Suppl.," p. 99 (1819).

M. tricolor, Sims, "Bot. Mag.," t. 2144 (1820), and Haw. "Rev.," p. 163 (1821), not of Willdenow.

Thunberg's specimens agree with those of Wolley Dod No. 1796, from sandhills at Duinefontein.

M. gramineum was founded upon the figure and description in Petiver, "Gazophylacium," Vol. I, p. 10, t. 88, f. 6, and "Cat.," Vol. II, p. 4, No. 488, which clearly represents this plant, although Petiver described the petals as yellow; but, as he seems to have had only dried specimens, he was perhaps misled by the yellowish colour they sometimes assume when dried.

Berger, "Mesemb.," p. 38, also quotes *M. clavatum*, Haw., as a synonym of this species, but that name was likewise founded upon a plant figured by Petiver on the same plate (t. 88, f. 7), which represents quite a different plant with creeping and probably perennial stems. The *M. tricolor*, Willd., quoted by the above authors for this species, is *M. criniflorum*, Linn. f. (which see).

M. linguaeforme, Thunb., "Fl. Cap.," p. 424.

This is represented by four detached leaves and three flowers, labelled as from a plant cultivated in Upsala Botanic Garden, which certainly do not belong to *M. linguiforme*, Linn., but probably to—

Glottiphyllum longum, N.E.Br., in Gardener's "Chronicle" (1922), Vol. LXXI., p. 9

Mesembryanthemum longum, Haw., "Obs.," p. 177 (1795).

M. loreum, Thunb., "Fl. Cap.," p. 421.

One flowerless specimen from Upsala Botanic Garden. Thunberg states that it grows on the Karroo between Olifants River and the Bokkeveld. The specimen, however, does not belong to *M. loreum*, Linn., but is probably *M. crassifolium*, Linn., and is identical with Schlechter No. 8316 (from Zout River) and Wolley Dod No. 1625 (from Governor's Cottage).

M. micans, Thunb., "Fl. Cap.," p. 426.

One sheet containing three specimens, collected below the Bokkeveld Mountains.

This plant is not *M. micans*, Linn., and it is erroneously quoted as a synonym of *M. collinum*, Sond. by Sonder in "Fl. Cap.," Vol. II. p. 443. That species, however, was founded upon specimens collected by Zeyher near the Gauritz River, in the Mossel Bay Division, a widely different locality from that of Thunberg's plant which is a different species and identical with Pearson No. 4903, from Hottentots Kloof, in the Ceres Division, which is stated to be a "weak herb, ½–1 foot; among bushes." But it is evidently weak and lanky and only partly woody from growing among or in the shade of bushes; otherwise, it is quite identical with Thunberg's shrubby specimens. I propose the following name for it:—

M. exspersum, N.E.Br.

M. micans, Thunb., "Prodr.," p. 91, not of Linnaeus.

A dwarf shrublet, 6–12 inches high, with woody branches about ¾ line thick and more slender branchlets. Branches opposite, rather widely diverging at their origin, with internodes 3–15 lines long, the young parts ascending, curved or flexuose, with a smooth brown bark on the old parts, and the young leafy branchlets purplish or brownish, covered with scattered longitudinally compressed papillae. Leaves opposite, 2–4 lines (5–6 lines on Pearson's specimen) long, ½ line thick on the dried specimens, erect or more or less spreading, not united at the base, distinctly concave-channelled down the face, rounded on the back, obtuse, of equal thickness throughout, not thickened at the apex, mostly straight, very densely covered with smaller papillae than those on the stem, whitish. Flowers solitary, terminal; pedicels 1½–2¾ inches long, slender, brownish or purplish, with scattered papillae like those on the stem, which become crowded at the apex. Calyx 5-lobed down to the top of the short and very broadly obconic ovary, densely papillate; lobes subequal, 1½–2 lines long, deltoid or deltoid-ovate, acute, two (or three?) of them with broad membranous margins, not appendaged. Petals numerous, 4–4½ lines long, linear, obtuse or notched at the apex, apparently of some shade of red.

M. moniliforme, Thunb., "Fl. Cap.," p. 415.

One sheet, containing two good specimens of the plant in a resting condition, that is, without either leaves or flowers. The original reference is—

M. moniliforme. Thunb., in "Nov. Act. Acad. Leop.-Car. Ephem.," Vol. VIII. Append., p. 7 (1791).

Thunberg's specimens represent the plant as about 3 inches high, with stout, crowded branches 4–6 lines thick, with numerous annular constrictions 1–1½ line apart, giving them the appearance of being formed of a number of flat, button-like beads, dark brown, glabrous.

This is not quite like the plant I described and figured, partly from memory, in the "Journal of the Linnean Society," Vol. XLV. p. 116, t. 5, f. 10; as the joints of that plant, as I remember them, were certainly not so flattened as in Thunberg's specimens, yet for all that, it may be specifically the same.

Thunberg collected it on hills near the Olifants River, towards the north, in the Van Rhynsdorp Division.

M. noctiflorum, Thunb., "Fl. Cap.," p. 414.

One specimen from a plant cultivated in Upsala Botanic Garden. It is *M. noctiflorum*, Linn.

M. nodiflorum, Thunb., "Fl. Cap.," p. 413.

Three sheets of good specimens, all of which belong to *M. nodiflorum*, Linn. It is stated to grow near Olifants River, in the Karroo below the Bokkeveld, in Zwartland, and elsewhere. The specimens quite agree with Schlechter No. 11068, from Eenkokerboom.

Sonder in "Fl. Cap.," Vol. II, p. 452, places *M. apetalum*, Linn. f. and *M. copticum*, Linn. as synonyms of *M. nodiflorum* (in which Berger follows Linn.), but they are both perfectly distinct from it and from each other. *M. copticum*, Linn. being the same as *Aizoon hispanicum*, Linn., and *M. apetalum*, Linn. f. is described above.

M. ovatum, Thunb., "Fl. Cap.," p. 417.

This name is represented in Thunberg's Herbarium by one sheet containing two very distinct species.

The right-hand specimen is identical with Zeyher No. 2624, from the valley and hills of the Zwartkops River, in the Uitenhage Division, and is undoubtedly the plant intended by the name *M. ovatum*, in Thunb., "Fl. Cap.," p. 417, for which Thunberg gives no locality.

The left-hand specimen is a branch of *M. lanceum*, Thunb.

But upon noticing the more erect slope of the letters and the different ink with which they appear to have been written, that the specific name "*ovatum*" was written at a different time from the name "*Mesembryanthemum*," I consulted the original description of *M. ovatum*, Thunb., and found that he there describes a totally different plant, which is not represented by any specimen in his Herbarium, nor can I find any in the Kew Herbarium that corresponds to his description. From this I think it probable that his original specimen must have got lost or destroyed, and that at a later date, when compiling his "Flora Capensis," he mistook the ovate-leaved plant (like Zeyher No. 2624) for his *M. ovatum*, and because he found it did not correspond with his original description, wrote a fresh one, made from the specimen he had before him, which is flowerless, and added such details of the flower as are given, and the statement that it is papulose, from his original description. Thus we have two very distinct species described by Thunberg under the name of *M. ovatum* at different dates. The plant originally described appears to be a very small papillate annual, whilst that later described has long (prostrate ?) stems, and is glabrous and smooth or not conspicuously papillate. The following is a translation of the original description :—

M. ovatum, Thunb., in "Nov. Act. Acad. Leop.-Car. Ephem.," Vol. VIII, Append., p. 8 (1791), not of any other book or author.

Plant dwarf, diffuse. Root annual, fibrous. Stems several, radical, as long as a finger-nail or an inch long, somewhat erect, simple, terete, leafless or slightly leafy (probably with or without bracts) at the middle, papulose, covered with crystalline scales (can elongated dried watery papillae be intended ?). Radical leaves several (or many), larger, stem-leaves fewer, fleshy, opposite, connate, the length of a finger-nail or an inch long, flat, obovate, tapering below, and again widened at the base, obtuse, entire, papulose above, papulose and covered with hyaline scales beneath, viscid, green or purple. Flowers terminal, solitary, white. Calyx fleshy, 5-partite, papulose, crystalline and scaly ; lobes 1 line long, with three a little longer, ovate, obtuse, concave, with a thin membranous margin. Petals numerous, inserted on the calyx and longer than it, linear, entire, white. Stamens very many, inserted at the base of the calyx and shorter than it ; filaments distinct, filiform, glabrous, white or purple ; anthers ovate, didymous, yellow. Nectary crowning the ovary, affixed in a wreath to the margin of the calyx, crenulate, green. Ovary depressed, 5-grooved, glabrous. Styles 5, erect, subulate, acute. Capsule fleshy, depressed-conical, 5-valved, 5-celled. Seeds numerous.

Thunberg states that this plant grows near the Cape, on sandhills, and that it is common. I cannot, however, as above stated, find any plant in the Kew Herbarium that agrees with the above description. Can this plant be a form of *M. criniflorum*, Linn. f. ?

As the above described plant must take precedence for the name *M. ovatum*, that in Thunberg's Herbarium now bearing that name requires to be renamed, and as I find it to be identical with a plant described by Berger, the following will be its synonymy :—

M. Haeckelianum, Berger in "Engler Bot. Jahrb.," Vol. XLV, p. 224 (1910).

M. ovatum, Thunb., "Fl. Cap.," p. 417 (1823), not of "Nov. Act. Acad. Leop.-Car-Ephem.," Vol. VII, Append., p. 8 (1791).

M. elongatum, Eckl. & Zey., "Enum. Plant. Afr. Austr.," p. 321 (1836), and in "Linnaea," Vol. XIX, p. 658 (1847).

M. angulatum var. *ovatum*, Sond. in "Fl. Cap., Vol. II, p. 454, partly (1862).

Root-stock perennial. Stems probably annual ascending or perhaps prostrate with ascending branches, up to 18 inches long and $1\frac{1}{2}$ line thick, angular, glabrous, and apparently smooth, with internodes up to 2 inches long. Leaves opposite, $\frac{3}{4}$–$1\frac{3}{4}$ inch long, 3–9 lines broad, lanceolate or ovate, acute, tapering into a petiole at the lower third, entire, glabrous, apparently smooth, fleshy. Flowers solitary in the forks of the stems or axillary. Pedicels $\frac{1}{2}$–1 inch long, moderately stout, glabrous, bractless. Calyx very unequally 4-lobed, the two larger lobes 6–10 lines long and 3–4 lines broad, lanceolate or ovate-lanceolate, acute, leaf-like, the two smaller 4–5 lines long, with a membranous ovate basal part and a subulate point. Petals numerous, about 6 lines long and $\frac{1}{2}$–$\frac{3}{4}$ line broad. Stamens numerous. Style $\frac{1}{2}$–$\frac{3}{4}$ line long, stout ; stigmas 4, short, apparently flat, acute.

Valley and hills of the Zwartkops River, in the Uitenhage Division, Zeyher No. 2624, and without locality, but probably from the same region, a flowerless specimen in Herb. (Thunberg).

Sonder in "Fl. Cap.," p. 454, quotes the plant named *M. ovatum* in Thunberg's Herbarium and Zeyher No. 2623 under *M. angulatum* var. *ovatum* as both being the same plant, whereas they are entirely different, the *M. ovatum*, Herb. (Thunberg), being *M. Haeckelianum* just described, and Zeyher No. 2623 being *M. angulatum*, Thunb.

M. papulosum, Linn. f., "Suppl.," p. 259 (1781).

One sheet containing three specimens in fruit. This species is not mentioned in Thunberg's "Flora Capensis," nor is there any indication of locality on the back of the sheet. But as it was described by Linnaeus fil. from a plant cultivated in Upsala Botanic Garden, it may have been raised from seed obtained from these fruiting specimens, or these specimens may have come from Upsala Garden ; and as they accurately agree with the description of Linnaeus fil., they must be accepted as the type of the species, for there is no specimen of the plant among those from the Herbarium of the younger Linné, and as he described many species from Thunberg's specimens, these may even possibly be those from which he described. He quotes, however, *M. Aitonis*, Jacq. as a synonym of *M. papulosum*. This is an error, for *M. Aitonis* has angular (not terete) stems, quite different leaves, straight (not deflexed) pedicels, and broad obovate (not subulate) tips to the calyx-lobes. *M. Aitonis* is also an eastern species from the Uitenhage Division, whilst *M. papulosum* grows near Capetown, for it is identical with Wolley Dod No. 2864, from the shore between Sea Point and Camps Bay. The plant is an annual, covered with large papillae, and is well marked by the peculiar curvature just below the calyx of the 6–8 lines long pedicels, causing the flowers to nod. The petals are small and yellow, "half as long as the shorter calyx-lobes."

M. pinnatifidum, Thunb., "Fl. Cap.," p. 427.

Two sheets ; one contains a specimen from Upsala Botanic Garden. The localities given by Thunberg are Mountains of Roode Zand, near Tulbagh Waterfall, and on the Paardeberg. All belong to

M. pinnatifidum, Linn. f., "Suppl.," p. 260 (1781).

M. pinnatum, Thunb., in "Nov. Act. Acad. Leop.-Car. Ephem.," Vol. VIII, Append., p. 15 (1791).

The specimens agree with those collected by Wolley Dod at Smitwinkel Vley.

M. pomeridianum, Thunb., "Fl. Cap.," p. 427.

One specimen from a plant cultivated in Upsala Botanic Garden. It is *M. pomeridianum*, Linn. To the synonymy of this plant must be added *M. pugioniforme*, Houtt., "Nat. Hist.," Deel II, t. 53, separately issued as "Handleid. Plant. Kruidkunde," Vol. IX, p. 32, t. 53; *M. capense*, Houtt., *ex* Thunb. "Fl. Cap.," ed. Schultes, p. 411. (See note under *M. eriniflorum*.)

M. pruinosum, Thunb., "Fl. Cap.," p. 425.

This is represented by one very poor specimen, which is *M. echinatum*, Ait., "Hort. Kew.," ed. 1, Vol. II, p. 194 (1789); *M. pruinosum*, Thunb., in "Nov. Act. Acad. Leop.-Car. Ephem.," Vol. VIII, Append., p. 17 (1791).

Stated to grow in the Karroo near Loeri River, in the Uitenhage Division, and in Cannaland. Sonder has retained *M. pruinosum* as a distinct species, but it is unquestionably identical with *M. echinatum*.

M. pugioniforme, Thunb., "Fl. Cap.," p. 424.

Two sheets containing scrappy specimens, which belong to *M. pugioniforme*, Linn. The locality given for it by Thunberg is near Verloren Valley and elsewhere. Sheet 2 contains a specimen from Upsala Botanic Garden.

M. ringens, Thunb., "Fl. Cap.," p. 423.

Three sheets marked *α*, *β*, and *γ*. Under this name Thunberg describes four varieties.

Sheet *α* contains two species, the two upper specimens, which I have marked "1" on the sheet, evidently represent the plant described by Thunberg under var. *α* as growing below the Roggeveld. They have leaves about 9 lines long, with 4–5 acute teeth (not bristles or cilia) on the margins and 2–3 on the keel. It appears to be *M. murinum*, Haw., "Obs.," p. 165 (1795).

The lower specimen and two detached leaves I think belong to *M. felinum*, Hill.

Sheet *β* contains two species, the upper left-hand specimen, marked "1," appears to be *M. murinum*, Haw., like the specimens on sheet *α*. The other two specimens, marked "2," seem to belong to the plant from Hantam, described by Thunberg under var. *γ*, which is possibly *M. mustellinum*, Haw., "Suppl.," p. 87 (1819).

Sheet *γ* contains two specimens of a species that I cannot identify; it is probably new, but the material is inadequate for description.

M. rostratum, Linn., Thunb. "Fl. Cap.," p. 424, states that this grows in the Karroo between the Olifants River and the Bokkeveld. But the species is not represented in Thunberg's Herbarium.

M. sabulosum, Thunb., "Fl. Cap.," p. 422.

One sheet, containing two specimens of the plant described and a small plant accidentally mixed with them of *M. pomeridianum*, Linn. The original reference is—

M. sabulosum, Thunb., in "Nov. Act. Acad. Leop.-Car. Ephem.," Vol. VIII, Append., p. 17 (1791).

Thunberg collected it in sandy places in Zwartland and near Saldhana Bay. His specimens are identical with Bolus No. 9004, from open places between Tulbagh Kloof and Pikiniers Kloof; with Stephens No. 7168, between Warmbaths and Modderfontein Farm; and with Stephens and Glover No. 8735, from Het Kruis, which have erroneously been distributed as being *M. pomeridianum*, Linn.

M. scabrum, Thunb., " Fl. Cap.," p. 420.

Three sheets, marked 1, 2, and 3, stated to grow on hills near Capetown.

Sheet 1 contains one very poor specimen of a species that is not determinable, but is not *M. scabrum,* Linn.

Sheets 2 and 3 both contain only specimens of *M. bracteatum,* Ait., " Hort. Kew.," ed. 1, Vol. II, p. 185 (1789).

M. secundum, Thunb., " Mus. Nat. Acad. Upsal. Auct.," Part II, p. 12 (1827), name only, no description.

This is not quoted in Thunb. " Fl. Cap." The specimen is identical with those of Burke No. 468 and is *M. articulatum,* Thunb. (which see).

M. serratum, Thunb., " Fl. Cap.," p. 427.

One sheet, containing one flowerless branch. It is possibly *M. tenuifolium,* Linn., but certainly not *M. serratum,* Linn. No locality is given for it.

M. sessile, Thunb., " Fl. Cap.," p. 419.

One specimen in fruit, collected in the Karroo between the Olifants River and the Bokkeveld Mountains. The original place of publication is—

M. sessile, Thunb., in " Nov. Act. Acad. Leop.-Car. Ephem.," Vol. VIII, Append., p. 14 (1791).

Evidently a woody shrub or shrublet. The type consists of a straight terete main branch about 1¼ line thick at the base, giving off numerous very short opposite leaf-bearing and flowering branchlets 2–5 lines long, including the flowers, and three spreading alternate branches 1–1½ inch long (but are broken at the ends and have been longer) and more than ½ line thick ; internodes 2–4 lines long ; bark brown. Leaves 1–2 closely placed pairs to each branchlet, 1–1¾ line long and about as broad, probably larger when alive, half-globose, rounded at the apex, flat or slightly concave (from shrinkage ?) above, very convex on the back, glabrous, smooth, apparently pellucid-dotted. Pedicel terminal and solitary on the short lateral branchlets, 1 line long, not bracteate (as Sonder wrongly states), gradually passing into the obconic calyx-tube, which is 1½ line long. Calyx 5-lobed ; lobes 1–1½ line long, ovate, obtuse. Flowers red, *ex* Thunberg, but the specimen is in unripe fruit. Capsule 2–2¼ lines in diameter, with 5 acute ridges on the flattish top, purplish, *ex* Thunberg.

I have not been able to match this with any specimen at Kew.

Sonder has placed *M. cymbiforme,* Haw., " Obs.," p. 264, as a synonym of *M. sessile,* Thunb., but that species is a totally different plant, with much larger leaves than those of *M. sessile,* Thunb.

M. spathulatum, Thunb., in " Nov. Act. Acad. Leop.-Car. Ephem.," Vol. VII, Append., p. 5 (1791), not of Willdenow.

This species is omitted from all other books, including Thunberg's " Flora Capensis," and no specimen so named exists in his Herbarium. *M. spathulatum,* Willd., which seems to have hitherto been mistaken for Thunberg's plant by Willdenow, De Candolle, Sonder, and Berger (who wrongly quotes the name as " *M. spathulifolium* "), is an annual, and is the same as *M. criniflorum* Linn. f., which grows near Capetown, whilst *M. spathulatum* of Thunberg is described as a perennial, from the Roggeveld region, and therefore not at all likely to be the same species. The following is a translation of Thunberg's description of *M. spathulatum.*

A stemless perennial. Root thick, fleshy, with fibres, divided above into several little stems. Leaves about 6, radical, approximate, erect, alternately opposite, about as long as a finger-nail (" unguicularia "), connate (at the base), ovate, obtuse, with a point (apiculate), tapering and smoothish at the basal part, papillate-scabrid at the upper part, slightly concave above, convex on the back, entire, green, with a red margin, the two lower withered. Flower solitary, from the centre of the leaves, radical, pedunculate, white. Peduncle shorter than the leaves, 1-flowered. Calyx 5-lobed; lobes ovate-lanceolate.

It grows on the intermediate Roggeveld, and was out of flower in November.

Although no specimen in Thunberg's Herbarium is named *M. spathulatum*, I find in it an unnamed specimen that so exactly agrees with the original description of that species, that I think there can be no doubt whatever that it is the specimen of *M. spathulatum* from which he made his description, but that he omitted to write the name on the sheet, thus probably causing it to be omitted from his "Flora Capensis." This specimen is marked on the back of the sheet merely as having been collected at the Cape of Good Hope by Thunberg. The following is a description of the specimen:—

A stemless perennial. Root-stock fleshy, about 2 inches long and ¾ inch thick at the upper part, where it divides into a few branches 3–4 lines long and 2–4 lines thick, each crowned with a small rosette of leaves; the lower part is abruptly contracted into a more slender portion giving off fibres. Leaves 4–6 in each rosette or growth, opposite, crowded, erect, or the outer spreading and withering; each leaf 4–7 lines long, 4–5 lines broad at the apical part, spathulate-obovate, very obtusely rounded at the apex, with a short apiculus, narrowed into a stout petiole-like part from about the middle to the base, where they are very shortly united, the upper part on both surfaces scabrid-papillate, from being covered with small, crowded, hard tubercles, which when highly magnified are seen to be themselves rough from being covered with very minute, hard, conical papillae; the lower or petiolar part is smoother; they appear to have been flat or perhaps slightly concave above, convex on the back. The specimen is flowerless, but there is a detached capsule, which evidently belongs to the plant, as the calyx-lobes are covered with the same peculiar tubercles, which on the lower part pass into crowded smooth dots, that are probably slightly prominent on the living plant. This capsule is 6 lines in diameter, hemispheric and 5-valved, with 5 calyx-lobes and a piece of a slender pedicel 1 line long, that is not dotted, attached to it. The calyx-lobes are 2–3 lines long, broadly ovate, apparently acute.

This very distinct plant is nearly allied to *M. calcareum*, Marloth, which also has the same peculiar type of tubercles upon its leaves, but they are longer, differently rounded at the apex, and are without the little apiculus present on those of *M. spathulatum*.

M. spinosum, Thunb., "Fl. Cap.," p. 420.

Three sheets, marked *α*, *β*, and *γ*, collected in the Karroo between Olifants River and the Bokkeveld Mountains, and at Hantam.

Sheet *a* contains a specimen identical with "*M. spinosum*, a," of Herb. Drège, but it is not *M. spinosum*, Linn., and is undescribed. I therefore describe it as—

M. aculeatum, N.E.Br.

A shrub resembling *M. spinosum* in habit, with 3-forked spiny flowering branches. Branches straight, not intricately intermingled. Internodes 4–12 lines long, with grey or brown bark on the old parts, the younger parts, including the spines, which are 6–9 lines long and nearly or quite half a line thick at their base, marked with elongated immersed dots, glabrous. Leaves opposite, short and stout, shortly united at the base, 1½–2½ lines long, 1½–2 lines broad and 1 line thick on the dried specimens, flat above, slightly keeled beneath, obtuse or apiculate, spreading, each with a young shoot 2–3 lines long in its axil, bearing two pairs of crowded leaves, obscurely gland-dotted. Flowers solitary from the tufts of leaves on the widely spreading spines. Pedicels 1 line or less long. Calyx 5-lobed, about 1½ line in diameter across the short and very broadly obconic (or hemispheric?) tube (ovary); lobes subequal, about 1 line long, ovate, obtuse, three with broad membranous margins. Corolla probably about 5 lines in diameter, with petals about 2 lines long. Stamens numerous, stigmas 5, erect, 1 line long, stout at the base, tapering to an awn-like point.

Drège's specimen was collected in the Nieuweveld, between Rhenoster Kop and Ganze Fontein, in the Beaufort West Division. The above description, however, is made entirely from Thunberg's specimen.

Sheet β contains two specimens of a very distinct spiny species that I cannot match with any specimen at Kew, but it is too imperfect to describe.

Sheet γ contains a specimen of a species allied to the true *M. spinosum*, Linn., but is apparently distinct. Masson also collected it; his specimens are at the British Museum. In Herbaria and books several species are included under the name *M. spinosum*.

M. splendens, Thunb., "Fl. Cap.," p. 414.

One specimen from Upsala Botanic Garden of *M. splendens*, Linn.

M. stipulaceum, Thun., "Fl. Cap.," p. 422.

One sheet so named, containing a specimen from Upsala Botanic Garden, which is *M. falcatum*, Linn., and not at all like *M. stipulaceum*, Linn.

M. subincanum, Haw., in "Phil. Mag.," Vol. LXIV, p. 427 (1824).

Two sheets thus named by Sonder, and apparently correctly. The specimens on one sheet match those of Zeyher No. 2604.

M. tenuifolium, Thunb., "Fl. Cap.," p. 421.

Four sheets, marked 1, 2, 3, and 4 (but the 4 is written very like a 2). No indication of locality is given.

Sheet 1 contains two specimens of a new species allied to *M. gracile*, Haw., but is more slender, and is identical with Rogers No. 16826 (from near Clanwilliam), and Stephens No. 5170 (from Boontjes River).

Sheet 2 contains a specimen of *M. polyanthon*, Haw., "Synop.," p. 270 (1812), of which *M. glomeratum*, Salm Dyck "Mesemb.," § 48, fig. 1 (not of Linnaeus) is a synonym. It is quite distinct from the plant wrongly figured by Salm Dyck as being *M. polyanthon*, Salm Dyck's plant being *M. violaceum*, D. C.

Sheet 3 contains a specimen of *M. productum*, Haw.

Sheet 4 contains two species. The right-hand specimen is *M. productum*, Haw., in "Phil. Mag.," Vol. LXIV, p. 425 (1824). The left-hand specimen may possibly be a weak branch of *M. tenuifolium*, Linn., but is not determinable with any certainty.

M. testiculare, Thunb., "Fl. Cap.," p. 412.

One sheet, containing two specimens in fruit of *M. testiculare*, Ait., "Hort. Kew.," ed. 1, Vol. II, p. 181 (1789); Thunb. in "Nov. Act. Acad. Leop.-Car. Ephem.," Vol. VIII, Append., p. 6 (1791).

Collected in the Karroo between Olifants River and the Bokkeveld Mountains.

M. tetragonum, Thunb., "Fl. Cap.," p. 426.

One specimen collected at Hantam, the type of **M. tetragonum,** Thunb., "Prodr.," p. 91 (1800). Thunberg's specimen is the same as Zeyher No. 702 and Pearson Nos. 3066, 3391, and 3688, which have incorrectly been distributed under the name of *M. defoliatum*, Haw. That species, however, differs in habit, has less connate leaves and shorter pedicels. Possibly a plant collected by Pearson at Plaatklip, Namaqualand, and distributed under the same name without a number, may be the true *M. defoliatum*, Haw. (*M. claratum*, Jacq., not of Haw.).

Thunberg describes the stems of *M. tetragonum* as "subtetragonous," but his specimen has terete stems with a slight compression at the nodes, where alone they can be called subtetragonous, and they are in no way different from the stems of the specimens of Zeyher and Pearson.

Sonder in "Fl. Cap.," Vol. II, p. 432, erroneously quotes *M. fasciculatum*, Thunb., as a synonym of *M. tetragonum*, but the two species are totally different, as I have noted under *M. fasciculatum*, Thunb.

N.B.—As Moench, two years later, in his "Methodus Plantas, Supplementum," p. 191 (1802), also published a species under the name of *M. tetragonum*, which has been omitted by modern monographers, I would like to point out to future workers upon this genus, that it is probably a synonym of some species described by Haworth. The description of *M. tetragonum*, Moench, is as follows:—

Stem erect, shrubby, glabrous, smooth greyish; branches tetragonous. Leaves decussate, distinct (i.e. not united at the base), triquetrous, keeled, acute, not dotted, with the margins and keel reddish. Flowers solitary subsessile. Calyx 5-lobed; lobes ovate, three with membranous tips. Corolla reddish, with subulate petals.

M. tortuosum, Thunb., "Fl. Cap.," p. 427.

Two sheets marked *a* and *β*. Collected in the Karroo.

Sheet *a* contains two specimens of *M. tortuosum*, Linn., which agree with those of Pearson No. 3057 (from the valley of Kamsoap).

Sheet *β* contains four pieces of *M. expansum*, Linn.

M. trichotomum, Thunb., "Fl. Cap.," p. 419.

One specimen, collected between the Olifants River and the Bokkeveld Mountains, the type of *M. trichotomum*, Thunb., in "Nov. Act. Acad. Leop.-Car. Ephem.," Vol. VIII, Append., p. 14 (1791).

This dwarf shrubby species continuously branches in a trichotomous manner from the base, with internodes 5–12 lines long, greyish, not dotted with white. The ultimate branches are only 1¼–2 inches long, not 2–3 inches as stated by Sonder. Leaves opposite, 2–5 lines long and apparently about 1 line broad and 1 line thick, flat above, slightly keeled at the apical part on the back (obsoletely trigonous, *ex* Thunberg), obtuse, firm, smooth (not papillate), green. Flowers terminal, solitary, sessile. Calyx 4-lobed; lobes unequal, the larger pair leaf-like up to 3 lines (or perhaps more) long, and twice as long as the shorter pair, which are ovate, obtuse, membranous, keeled on the back. Corolla with the outer petals spreading, dark purple, the inner short, whitish. Styles 4, very short, erect, purple; stigmas simple, spreading, yellow.

The above is Thunberg's description with particulars from the specimen included. The floral structure cannot be seen without damaging the specimen, as there are only two flowers upon it. I fail to match this species with any specimen at Kew, but Pearson No. 5549 is evidently allied to it, differing by its foliage, white-dotted branches, and pedicellate flowers.

M. tripolium, Thunb., "Fl. Cap.," p. 417.

One specimen from Upsala Botanic Garden, which is *M. lanceum*, Thunb., not *M. tripolium*, Linn. (See under *M. lanceum*.)

M. truncatum, Thunb., "Fl. Cap.," p. 412.

One sheet, containing two specimens, collected among rocks in the Kamanassie Karroo in all probability, as he states that it flowers in January and February, and he was in that region in January, 1774. But Thunberg also states that it grows in the Karroo below the Bokkeveld, and near Hex River. As he only collected in these localities in October and November, 1773 and 1774, the Kamanassie Karroo is the more probable locality for it, and I have no doubt he mistook other species of this group for *M. truncatum*, for many of them are very similar in appearance. This plant is—

Conophytum truncatum, N.E.Br., in the Gardeners' Chronicle" (1922), Vol. LXXI, p. 261.

Mesembryanthemum truncatum, Thunb., in "Nov. Act. Acad. Leop.-Car. Ephem.," Vol. VIII, Append., p. 5 (1791).

Plant forming dense tufts, composed of closely packed branches $\frac{1}{2}$–$1\frac{1}{2}$ inch long and about 3 lines thick, including the numerous wrinkled, slightly shining, brown sheaths of a firm or somewhat parchment-like (not membranous) texture with which they are covered. Growths about 4 lines long and 3–4 lines in diameter across the top, which Thunberg describes as "retuse-truncate." The dried growths are glabrous, smooth, slightly shining, of a tan-brown colour, and conspicuously dotted. The specimens seem to have the remains of either some very damaged flowers or young fruits that are damaged and not in a fit state to examine, and also one perfect capsule $2\frac{1}{2}$ lines in diameter, with 5 valves. Thunberg describes the calyx as 4-lobed, but in this specimen it was doubtless 5-lobed, although the lobes have disappeared. Yet it is not uncommon with species of this genus for flowers on the same plant to vary in the number of the calyx-lobes from 4–5.

This species seems never to have been found by any other collector, and has never been in cultivation.

M. tuberosum, Thunb., "Fl. Cap.," p. 421.

This species is now missing from Thunberg's Herbarium. But as, according to the description, it is quite a different plant from that to which Linnaeus had long before applied the same name, I propose for it the following change of name, and add a translation of Thunberg's description :—

M. stratum, N.E.Br.

M. tuberosum, Thunb., "Prodr.," p. 90 (1800), and "Fl. Cap.," p. 421, not of Linnaeus.

Stem prostrate, 9 inches or more long, filiform, terete, branching, glabrous, greyish. Branches opposite, somewhat secund, decumbent, about 3 inches long, papulose, green. Leaves opposite, united and sheathing at the base, about half as long as a finger-nail, terete-subulate, erect, papulose. Flowers terminating the branchlets, pedunculate, red. Peduncle thickened (upwards ?), about as long as the leaves, 1-flowered, papulose. Calyx 5-lobed, papulose ; lobes lanceolate, somewhat obtuse, erect. Petals linear, obtuse.

Grows on dry plains near Downes (Daunis), in the Calvinia Division.

Thunberg makes no mention of the plant having a tuberous root-stock or producing tubers, so that his name "*tuberosum*" seems inapplicable, unless he intended it to mean that because the plant was papillate on all green parts it was full of small swellings (from *tuber*, a swelling).

M. umbellatum, Thunb., "Fl. Cap.," p. 414.

There are six sheets bearing this name, marked *α*, *β*, *γ*, *δ*, *ε*, and *ζ*. Thunberg describes three plants as varieties under this name, but I am unable to fit his specimen to the descriptions with certainty.

Sheet *α* contains one specimen of a species I am not able to identify. It is identical with Bolus No. 9009 (from near Clanwilliam).

Sheet *β* contains three specimens : the right-hand specimen, which I have marked "B" on the sheet, is *M. parviflorum*, Jacq., "Hort. Schoenbr.," Vol. III, p. 15, t. 278 (1798). The other two specimens, marked "A," I do not match with any species at Kew.

Sheet *γ* contains two specimens of what is probably an undescribed species, which is the same as Pearson No. 5181 (from the southern slopes of Pikinier's Pass).

Sheets *δ* and *ε* contain specimens that I believe to belong to *M. tuberosum*, Linn.

Sheet *ζ* contains two specimens of a new species allied to *M. arboriforme*, Burch., but has shorter and stouter leaves, and the branches of the cyme diverge at a smaller angle, but it is scarcely in good enough condition to describe from.

Neither of the specimens belong to *M. umbellatum*, Linn., and I am unable to say to which of the localities he gives the various specimens belong. He states that they grew in the Karroo between Olifants River and the Bokkeveld Berg, and in the Karroo beyond Hartequas Kloof.

M. uncinatum, Thunb., "Fl. Cap.," p. 420.

One sheet, containing four specimens, three of which belong to *M. uncinatum*, Linn., "Sp. Pl.," ed. 1, p. 483 (1753); *M. uncinellum*, Haw., "Rev.," p. 125 (1821).

These specimens are identical with Rehmann No. 2844 (from Verkeerde Vley, in the Ceres Division).

The fourth specimen is a scrap of *M. villosum*, L. (*M. Ecklonis*, Salm Dyck, "Mesemb.," § 49, fig. 5), evidently accidentally mixed with the other specimens.

Thunberg collected *M. uncinatum* on the Karroo between the Olifants River and the Bokkeveld Mountains.

M. verruculatum, Thunb., "Fl. Cap.," p. 435.

One sheet, containing three specimens, all belonging to different species, neither of which is *M. verruculatum*, Linn.

Thunberg gives two descriptions, and states that one (description *a*) grows in the Karroo between the Olifants River and the Bokkeveld, and the other (description *β*) at Hantam.

The lower specimen on the sheet, which seems to fit description "*a*," has been marked "*β*" by Sonder, and quoted by him as being *M. veruculoides*, Sond. But it is not the plant described by him under that name, his description having been made from a plant collected by Zeyher. Thunberg's specimen is not determinable.

The middle specimen on the sheet is *M. glaucum*, Linn.

The upper specimen is different from either of the others, and consists of a piece of a stout, prostrate, leafy, purple stem without flowers. It is identical with Wolley Dod's specimens Nos. 2420 and 3663 (from Lion's Head, near Capetown), which I have not identified.

Besides these enumerated above, Thunberg's Herbarium contains four sheets that are unnamed by Thunberg, one of them being named by Sonder. The following is my identification of these:—

M. caninum, Lam., "Encycl.," Vol. II, p. 487 (1786).

One sheet, labelled on the back as from Upsala Botanic Garden.

M. noctiflorum, Linn.

One specimen, labelled "*Caroo infra Bockland.*"

A specimen that is without information on the sheet, may possibly be *M. spectabile*, Haw., "Obs.," p. 385 (1795).

M. villosum, Linn., "Sp. Pl.," ed. 1, p. 483 (1753).

M. Ecklonis, Salm Dyck, "Mesemb.," § 49, fig. 5 (after 1836).

One specimen, stated on the back of the sheet to have been collected at the Cape of Good Hope.

It is correctly named *M. Ecklonis* by Sonder, which so exactly agrees with the original description of *M. villosum* under the name of "*Mesembryanthemum caule foliisque pubescentibus*" in Linnaeus, "Hortus Cliffortianus," p. 216, as quoted in his "Species Plantarum," that I have no doubt whatever of its identity with that plant, although there is no specimen of *M. villosum* in the Linnean Herbarium.

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SOUTH AFRICAN GRAMINEAE.

A NEW GENUS AND SEVEN NEW SPECIES.

By Sydney M. Stent.

Mosdenia. Genus novo. *Tragus* similis sed glumae emuricatae, subaequales spiculae solitariae. Folia eciliata.

Mosdenia waterbergensis, Stent. (Pl. I.)

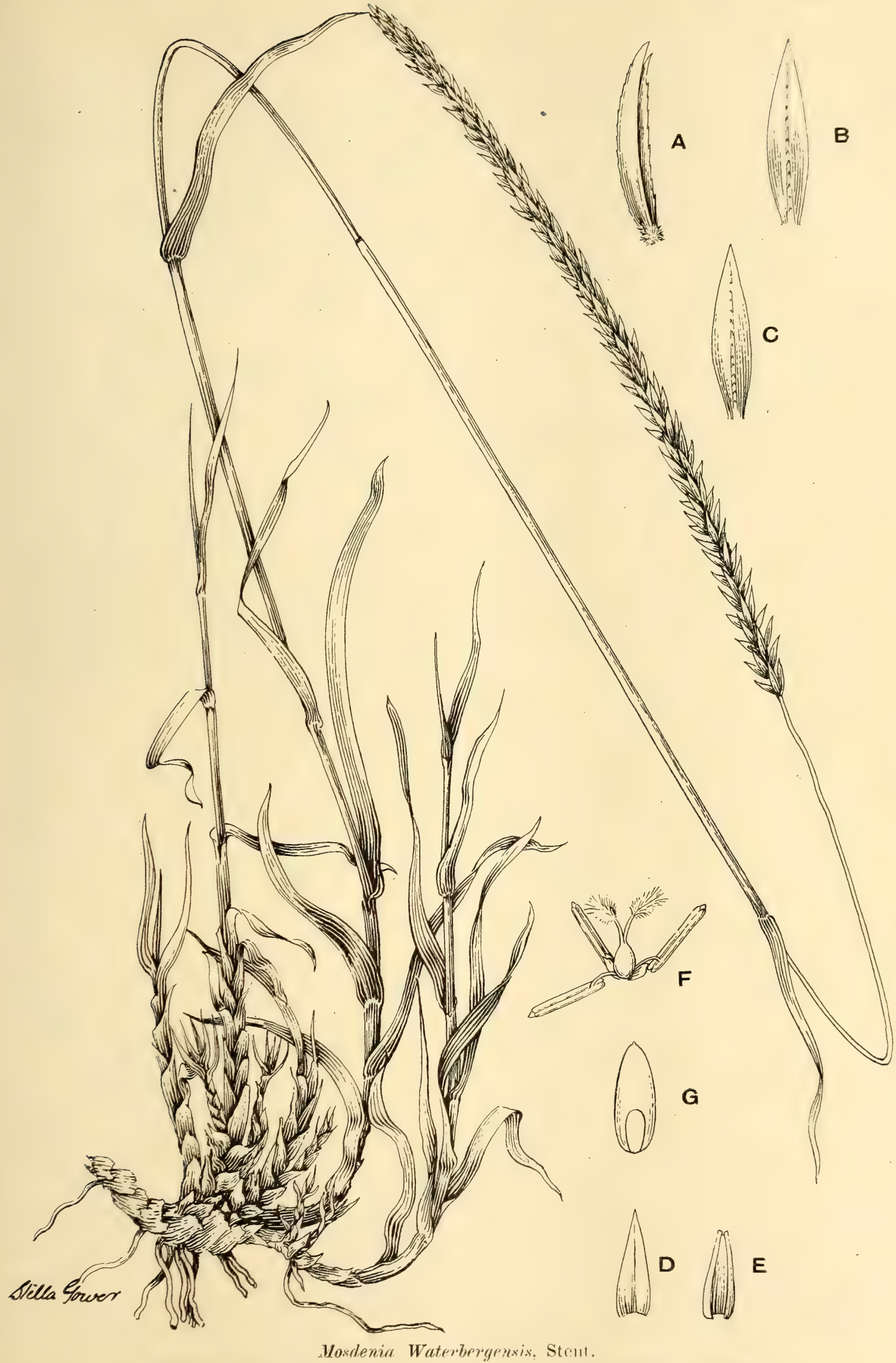
Gramen perenne, basim decumbente stolonifere; stolones cataphyllibus brevibus dense imbricatis obtecti. *Innovationes* intravaginales, vaginis brevis et foliis distichis. *Culmi* ascendentes 60–90 cm. longi, simplices, vel ad nodes inferiores ramosi; internodii breviter exserti. *Foliorum vaginae* teres, arctae, striatae, glabrae, laeves, laminis pallidiores; *ligulae* brevis 0·5–0·3 mm. membranaceae; *laminae* lineares ad 12 cm. longae, 5 mm. latae, glaucescentes, glabrae. *Spica* cylindrica, densa, spiculis solitarus nodos tomentosos rachis ferentibus; rachis striata, scabris. *Spiculae* 3·75 mm. longae, uniflorae, anguste lineares, subfalcatae, glabrae, praeter basem crassum minute-pilosum; *glumae* subequales, inferior paulo longior et latiore, navicularis, falcata, rigide membranacea; carina virida prominente, superior idem sed angustior et strictior; *valva* 3 mm. longa, hyalina, 1–3 nervosa; *palea* subaequale. *Stamina* 3. *Styli* distincti, breves; *lodiculae* truncatae, ovarium subaequantes.

Perennial prostrate ascending, *root-stock* stoloniferus, stolons covered with short, dry, densely imbricate cataphylls. *Innovation shoots* intravaginal with short sheaths and distichously-arranged leaves. *Culms* ascending 60–90 cm. high, simple or branched from the lower nodes, internodes shortly exserted, leafy towards the base. *Leaf sheaths* terete, tight striate, glabrous, paler than the blades, smooth; *ligule* short 0·5–0·3 mm. membranous; *blades* linear, tapering to an acute or sub-acute point, up to 12 cm. long × 5 mm. broad, bluish-green, glabrous, smooth or scaberulous on the margins, without a distinct midrib, rounded or slightly eared at the base. *Inflorescence* a single dense spike, the sessile spikelets arranged singly on minutely and densely tomentose notches, in whorls or spirals round a common ribbed and scabrid axis, from which they fall entire. *Spikelets* 3·75 mm. long, 1-flowered, glabrous except at the minutely hairy thickened base, narrow linear, subfalcate; *glumes* subequal to equal, lower slightly longer and broader than the upper, boat-shaped, curved, rigidly membranous, with a prominent green scabrid keel; upper like the lower but narrower and straighter; *valve* about 3 mm. long, delicately hyaline, 1-nerved or sub 3-nerved; *pale* nearly equalling the valve. *Stamens* 3. *Ovary* ovate; *style* short, distinct; *lodicules* truncate, about as large as the ovary.

On sand-veld, Mosdene, Naboomspruit, Waterberg, Transvaal, *Galpin* M. 447; Rooikop, Springbok Flats, *Pole Evans*.

This grass was first noticed by Mr. Galpin on his farm Mosdene, and later was collected by Dr. Pole Evans on the farm Rooikop. The latter reports the grass as growing plentifully but being, on account of its short herbage, of little agricultural value.

Plate I.


A
B
C
F
G
D
E
Stella Gower

Mosdenia Waterbergensis, Stent.
A.—Spikelet. B.—Lower glume. C.—Upper glume. D.—Valve. E.—Pale.
F.—Pistil and stamens. G.—Grain.

Eragrostis valida, Stent.

Gramen perenne, dense caespitosum ; rhizoma obliqua. *Culmi* erecti, glabri, validi, 120–150 cm. longi, internodiis inclusis ; nodis paucis. ***Foliorum vaginae*** longae, arctae imbricatae, glabrescentes, inferiores 26 cm. longae, dense hirsutae, plerumque purpureae ; *laminae* lineares longe tenuiterque, acutatae, ad 60 cm. longae, 7 mm. latae, glabrae, sed post ligulos piliis longiis mollibus tectis, planae, rigidae, supra asperulae, infra, laevae ; *ligulae* ad marginem dense ciliatum redactae. *Panicula* patula vel contracta ad 30 cm. longa, rhachibus sulcatis minute scaberulis ; *rami* subverticillati vel fasciculati, prope basim divise, *ramuli* breves spiculis pedicellis brevibus-appressis. *Spiculae* griseo-olivaceae, lineares, ad 6·25 mm. longae, 2 mm. latae, 5–7 floribus ; rhachilla subpersistens tandem disarticulata ; *glumae* subaequales, acutae, carinis scabris, superior paulo longior ; *valvae* obtusae circa 2 mm. longae ; *paleae* truncatae, carinis scabris ; *antherae* 3 mm. longae ; *caryopsis* oblonga, 0·3 mm. longa, fusca, dorsa concava.

Perennial densely tufted on an oblique rhizome. *Culms* erect, glabrous, simple, stout, 4–5 feet high, and sheathed for almost their entire length, few noded. *Sheaths* long, the lower ones up to 26 cm. long, tight, imbricating, softly hairy with tubercle based hairs or glabrescent ; *blades* linear, tapering to a fine point, up to 60 cm. long × 7 mm. broad, glabrous except for the long soft hairs at the base behind the ligule, smooth below, finely scaberulous above, finely ribbed, flat and rather rigid ; *ligule* a short densely ciliate rim. *Panicle* open or contracted up to 30 cm. long ; *rachis* sulcate, minutely scaberulous, with glandular swellings in the axils of the branches ; *branches* subverticillate or fascicled, divided from near the base. *Spikelets* on short pedicels, more or less appressed to the short branchlets, dark-greyish or olive-green, up to 6·25 mm. long × 2 mm. broad, linear, 5–7-flowered, rachilla sub-persistent, ultimately breaking up ; *glumes* subequal, acute, scabrid on the keel, lower 2 mm. long, upper slightly longer ; *valves* obtuse, 2 mm. or slightly longer, side nerves reaching beyond the middle ; *pale* truncate, with broad flaps and scabrid keels ; *anthers* 3 mm. long ; *grain* oblong, quadrangular, 0·3 mm. long, brown, concave or grooved on the back.

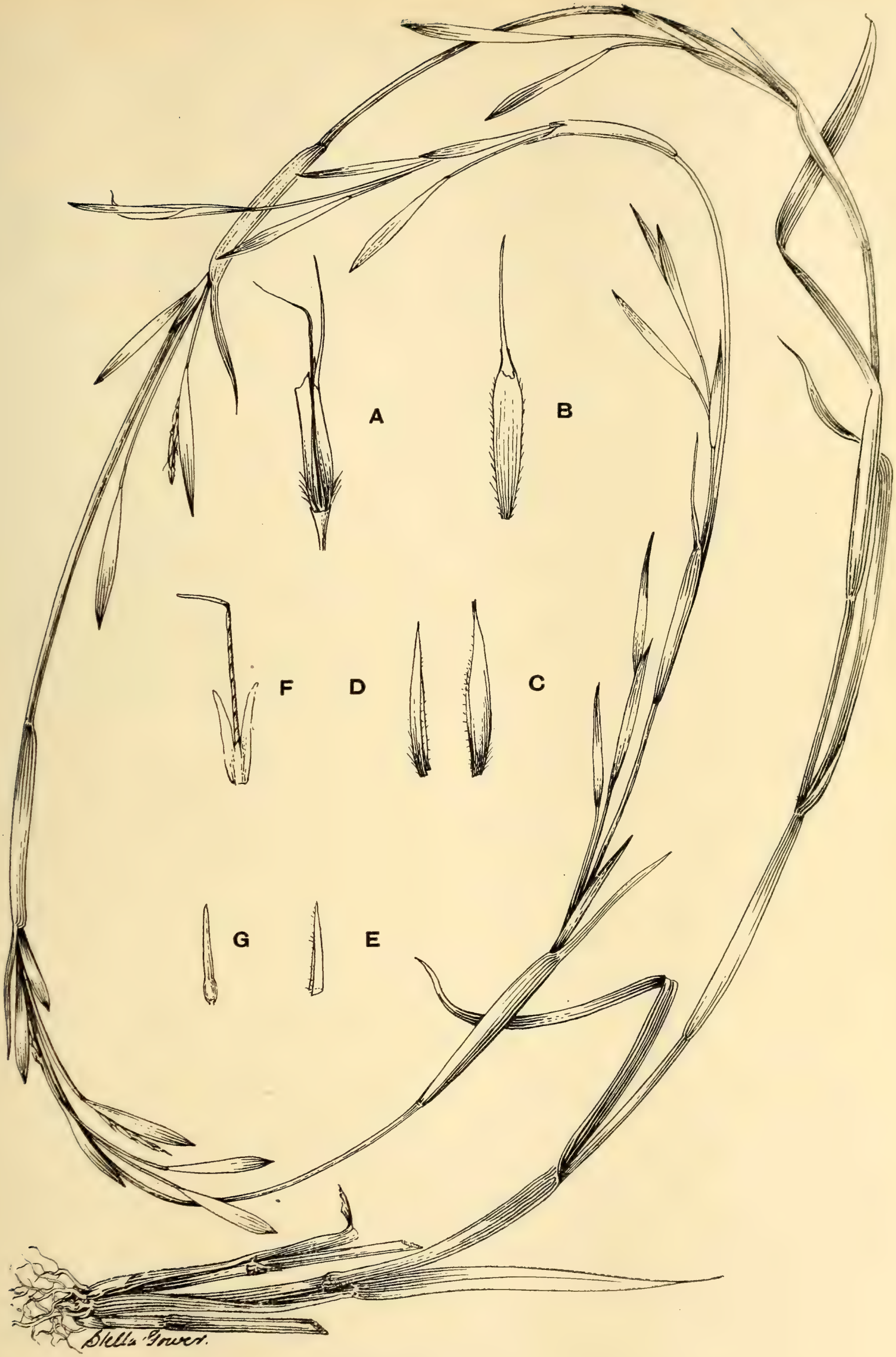
Maritzburg, Natal, *Angus* 2 (*Govt. Herb.* 13862).

Near to *E. curvula* var. *valida*, but a stouter, coarser grass, with long, tight sheaths that enclose the clums, the lower ones very hairy and long, usually of a purplish colour.

Mr. Angus says of this grass : " A big, coarse variety that grows very erect, has a dark purple stem, which is covered thickly with hairs, and is, if anything, better relished by cattle than No. 3 (*E. curvula*) . . . apparently good feeding, as cattle get into good condition whilst feeding on them."

Schizachyrium inclusum, Stent. (Pl. II.)

Gramen annuum. *Culmi* erecti, simplices, circa 75 cm. longi, 5-nodi, glabri, nodis inferioribus brevissimis teretibus vel subcompressis. *Foliorum vaginae* laxae, carinae glabrae laeves ; *ligulae* membranaceae, ad 0·75 mm. longae, minute fimbriatae ; *laminae* lineares, base paulo constricti, glabrae, sed post ligulam pilis longis paucis tectis, 6–10 cm. longae, 2·3 cm. latae, longe attenuatae, apicibus obtuses vel subacutis, planae, vel complicatae plerumque rubescentes. *Panicula* spuria longa, angusta, exigua ; *rami* graciles ; *spathae* 3·5 cm. longae, angustae rabescentes laminas minutas apicibus gerentes ; *pedunculi* communes graciles, clavati. *Racemi* 2-nati, in spathis inclusi, 2·5 cm. longi, ad circa 6 articuli ; *articuli* 3·5 mm. longi, aliquantum concavi, cuneati, apici cupuliforme dentato, 1 mm. longo, breviter ciliati, alioqui glabri ; pedicelli articulis aequales, complanati, lineares, breviter et parce ciliati, apicibus 2-dentatis. *Spicula sessilis* inter articulum pedicellumque a latere admodum compressa, 4 mm. longa, callo 1 mm. longo, barbato ; *gluma inferior* chartacea, marginibus hyalinis, dorso convexa, apicem versus bi-carinata et asperula, nervebus intra-carinis 4–5 ; *gluma superior* cymbiforma acuta, 1-nerves, breviter mucronata, inferne subchartacea, apicem versus membranacea, vel fere hyalina ; *valva inferior* linear oblonga, hyalina, vacua, 2–3 mm.



Schizachyrium inclusum, Stent.

A.—One joint of raceme with sessile and pedicelled spikelets.
B.—Reduced pedicelled spikelet and pedicel.

SESSILE SPIKELET. C.—Lower glume. D.—Upper glume. E.—Lower valve. F.—Upper valve. G.—Grain.

longa ; *valva superior* admodum biloba, segmentis linearibus obtusis minute ciliatis ; palea desunt ; caryopsis linear, acuta, 3 mm. longa. *Spicula pedicellata* gluma brevissima redacta, mucrone 3·5 mm. longo.

Annual. *Culms* erect, simple, 75 cm. high, about 5-noded, glabrous, lower internodes very short, terete, or sub-compressed. *Leaf sheaths* loose, keeled glabrous, smooth ; *ligules* membranous, up to 0·75 mm. long, minutely fimbriate ; *blades* linear, slightly constricted at the junction of the sheath, scaberulous on the margins, glabrous except for a few long, white, tubercled based hairs at the base behind the ligule, 2–3 mm. broad, 6–10 cm. long, gradually tapering to an obtuse or sub-acute point, flat or folded, usually turning reddish. *False panicle* long, narrow, and scanty. *Spathes* on sub-capillary branches about 2 cm. long, slender scarious, rusty red towards the tips, up to 3·5 cm. long and 2 mm. broad folded, tipped with a minute undeveloped leaf. *Racemes* very slender on short upward clavate peduncles, entirely included or only partially exserted from the spathes, 2·5 cm. long and about 6-jointed, joints 3·5 mm. long, widening upwards, somewhat concave, with a toothed cupuliform appendage 1 mm. long, shortly and sparsely ciliate, otherwise glabrous. *Pedicles* as long as the joints, flattened, linear, 2-toothed at apex, shortly and sparsely ciliolate on the margins. *Sessile spikelets* linear, laterally compressed, convex on the back, 4 mm. long, bearded callus 1 mm. long ; *glumes* equal, *lower* chartaceous with thinly membranous margins, rounded on the back, 2-keeled and scaberulous towards the 2-toothed tip, sparsely ciliate on the margins, intra-carinal nerves 4–5 ; *upper* boat-shaped, acute, 1-nerved, nerve extending into a short mucro, thinly chartaceous in the lower part becoming thinly membranous to almost hyaline upwards ; lower floret reduced to a linear oblong, hyaline, nerveless valve 2·3–3 mm. long ; upper floret ☿ , valve deeply bifid to below the middle, segments linear, obtuse, minutely ciliolate, pale wanting, grain linear, acute, 3 mm. long. *Pedicelled spikelets* reduced to one very small glume, terminating in a mucro 3·5 mm. long.

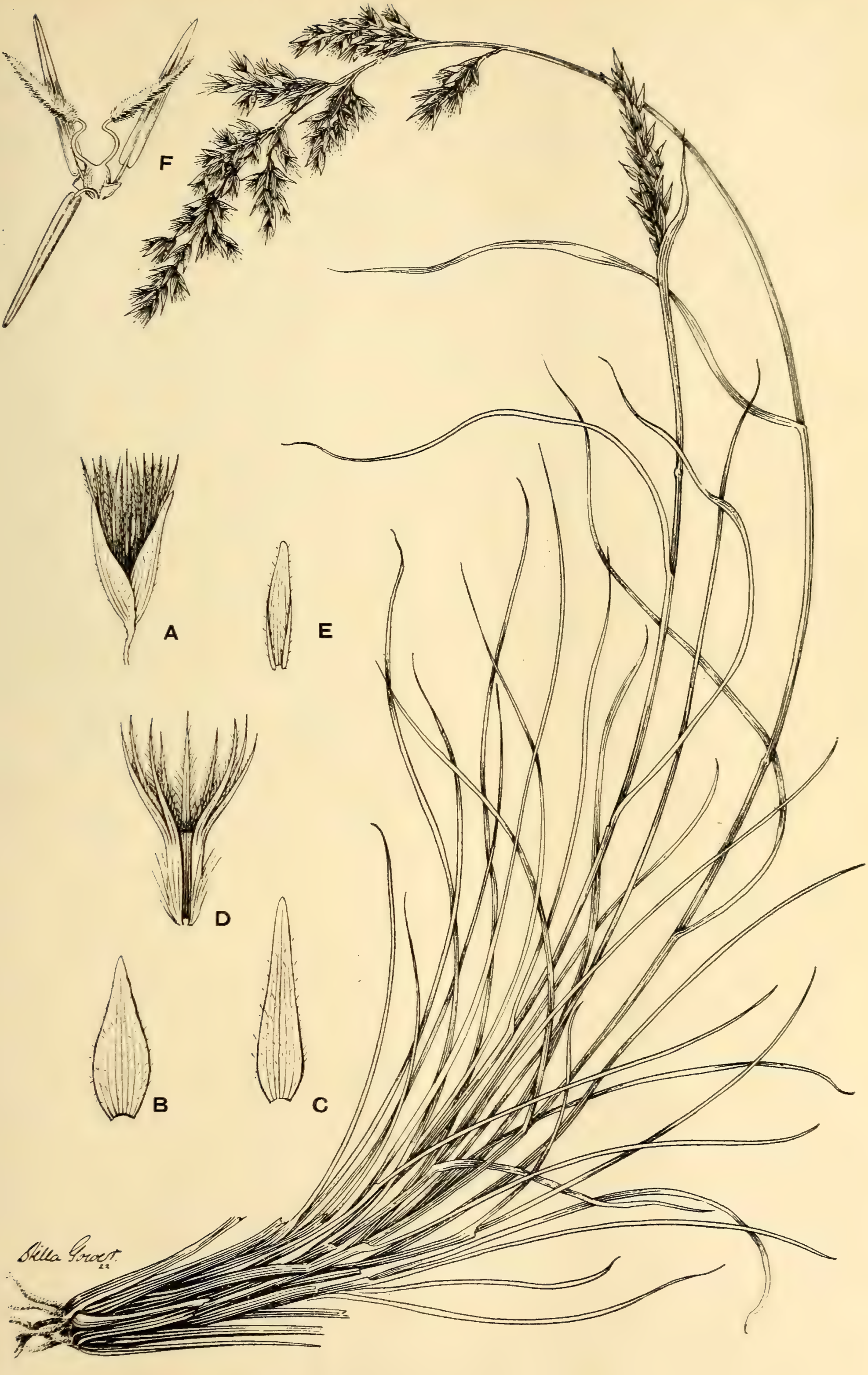
Enterprise, Rhodesia, *Eyles* 1646.

This species is founded on one specimen sent by Mr. Eyles. The specimen is a good one and quite complete, but it is obvious that more material of the same species might show trifling variations in measurements, etc., and possibly the culms may be branched.

Enneapogon pretoriensis, Stent. (Pl. III.)

Gramen perenne. *Culmi* erecti, simplices, 30–60 cm. longi, glabri vel internodi inferiores hirsuti. *Foliorum vaginae* supra arctae, glabrae ; *laminae* anguste, lineares, plerumque convolutae, 18 cm. longae, 2·5 mm. latae. *Panicula* angusta, ovata ; *rami* solitarii longiores ad 15 mm. longi, internodi rachis inferiores ad 14 mm. longi, superiores deminuenti. *Spiculae* 5 mm. longae ; *glumae* equales vel subequales, breve pilosae, apicibus truncatis fulvis ; *valvae* inferiorae dorsis vilosae, ventris glabrae, sed, lobis basin filis patentibus fimbriatae ; *aristae* plumosae, 3 3·5 mm. longae ; *palae* 4 mm. longae, hirsutae.

Perennial. *Culms* fascicled on a short oblique rhizome, erect, simple, wiry and slender, 30–60 cm. high, glabrous or often shortly hairy at and below the lower nodes, 1–2-noded. *Sheaths* tight except the basal ones, glabrous, finely ribbed ; *blades* narrow, linear, convolute or flat, finely pubescent above, up to 18 cm. long × 2·5 mm. broad, finely ribbed, with 1–2 lateral nerves on either side the midrib. *Panicle* contracted, ovate ; *branches* scattered, lower about 14 mm. apart, upper increasingly nearer to each other. *Spikelets* crowded, sessile or shortly pedicelled, about 5 mm. long ; *glumes* equal to subequal, shortly hairy, greyish, rust coloured at the truncate tips ; lower rather broader and 7–9-nerved ; upper narrow, 5-nerved, nerves mostly evanescent above ; *lower valve* 1 line long (excluding awns), villous on back from base to near the middle, glabrous on inner surface except for ring of patent hairs at base of awns ; *awns* plumose to beyond middle, 3–3·5 mm. long, subequal, tips bare and scabrid ; *pale* 4 mm. long, shortly and sparsely hairy on the back, villous on the flaps, and ciliolate on the keel ; *anthers* 2 mm. long.



Enneapogon Pretoriensis. Stent.

A.—Spikelet. B.—Lower glume. C.—Upper glume. D —Valve. E.—Pale.
F.—Pistil and stamens with lodicules.

Pretoria, Wonderboom, *Burtt-Davy* 8905 ; northern slopes of Magaliesberg, *Fouché* 1. (Of little economic value.)

Near to *E. scoparius*, from which it differs chiefly in the laxer and more distantly branched panicle and broader leaves.

Eragrostis Burttdavii, Stent.

Gramen perenne, dense caespitosum, rhizomate repente pluribus dense confertis brevibus innovationibus. *Culmi* geniculati, 8–40 cm. longi, glabri, 1–2 nodi, internodia exserta. *Foliorum vaginae* glabrae, tenuiter sulcatae, inferior laxae, breves, latae. *Laminae* glabrae, lineares, culmorum, 7 cm. longae, 2 mm. latae, innovationium angustiores et breviores, planae vel convolutae, apicem versus flexuosae. *Panicula* ovata, ad 10 cm. longa, 7 cm. lata ; *rami* solitarii vel 2-nati, gracili, flexuosi ; *ramulosi* 2–4 spiculis. *Spiculae* 4 mm. longae, 2 mm. latae, 6–9 florae ; *gluma* inferior 0·75 mm. longa, obtusa, superior 1·25 mm. longa, subobtusa ; *valvae* 1·5 mm. longae, obtusa, scaberulae, violaceae, apicibus flavibus ; *palea* valvam aequans, truncata, marginibus late inflexis.

Perennial, densely caespitose, on a creeping rhizome with many densely crowded, short innovation shoots. *Culms* geniculate, 8–40 cm. high, glabrous, 1–2-noded, internodes exserted. *Sheaths* glabrous, finely ribbed, tight except the lower ones, which are broader, stout and loose ; *ligules* a fringe of hairs. *Leaf blades* glabrous, linear, tapering to a fine point, those of the culm 2 mm. × 7 cm., those of the innovation shoots narrower and shorter, finely ribbed, midrib scarcely broader than the lateral veins, flat or convolute and flexuous in the upper part. *Panicle* ovate, up to 10 × 7 cm. ; *branches* solitary or or 2-nate, undivided from 2–14 mm. above the base ; *rachis* scaberulous or smooth, flexuous ; *branchlets* 2–4 spikulate ; *pedicels* 2–4 mm. long. *Spikelets* linear, lanceolate, about 4 × 2 mm., 6–9-flowered ; *glumes* unequal, lower 0·75 mm. long, obtusa, upper 1·25 mm. subobtuse ; *valves* 1·5 mm. long, obtuse, scaberulous, purple, with light yellowish tips ; side nerves fine, extending to beyond the middle ; *pale* equalling the valve, truncate, scaberulous, flaps broad ; *anthers* 3, up to 1 mm. long.

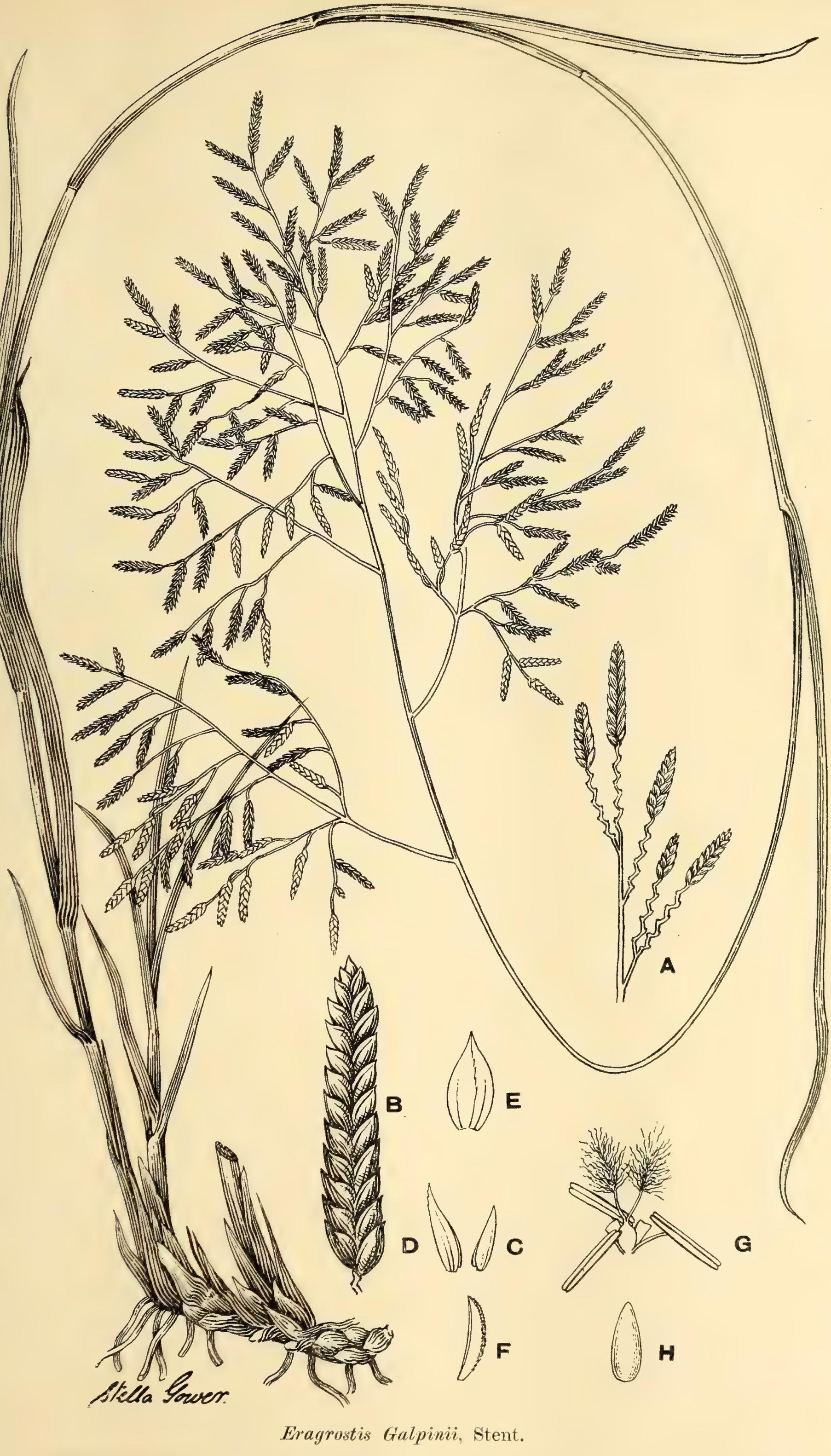
Very near to *E. bicolor*, Nees ; but with a shorter and, in comparison, broader panicle and rather broader spikelets.

Bloemhof, Transvaal, *Burtt-Davy* 10506 ; Great Karasberg, *Pearson in Bolus Herb.* 8480.

Eragrostis Galpinii, Stent. (Pl. IV.)

Gramen perenne. *Culmi* fasciculati, rhizomate repente, erecti, vel geniculato-ascendentes, glabri, ad 90 cm. longi, plari nodi, nodi inferiores brevi ; culmorum bases et rhizomata cataphyllibus brevibus et scariosibus obtecta. *Foliorum vaginae* laxae, striatae, inferiores carinatae et compressae ; *laminae* angustae, lineares, ad 15 cm. longae, 5 mm. latae, apicibus angustis abtusis, planae, vel complicatae, rigidae, glabrae. *Panicula* late oblonga vel pyramidalia, patula, laxa ad 20 cm. lata, 20 cm. longa ; rami solitarii, inferiores distantes ramulos 1–3 cm. e basi gerentes. *Spiculae* fere secundae ad 23 mm. longae, 2·5 mm. latae, circa 10–30 florae ; rhachilla flexuosa, primo persistente ; *glumae* subequales, inferiores 1·5 mm., superiores, 2 mm. longae, minute asperulae ; *calvae* purpureae, subacutae, omnino minute scabridae ; *palea* acute, hyalina inter carinas rigide-ciliatas ; styli distincti ; lodiculi truncati ; *antherae* 1·3 mm. longae.

Perennial. *Culms* fascicled on a creeping rhizome, erect or geniculate-ascending, simple or branched, glabrous, slender, up to 3 feet high, many-noded, internodes included, or shortly exserted, or the upper most sometimes long exserted, lower short ; bases of culms and rhizomes covered with short, scarious scales. *Sheaths* loose, striate, the lower ones sub-compressed and keeled, glabrous except at the often long-bearded mouth ; *ligule* a ciliate membranous rim ; *blades* narrow, linear, up to 5 mm. broad × 15 cm. long, tapering to a narrow, rounded point, flat or folded, rather firm, glabrous, smooth below except towards the tips, finely scaberulous above. *Panicle* broadly oblong or pyramidal, spreading, lax up to 20 cm. broad × 20 cm. long, branches solitary, lower ones rather distant, spreading,


A
B
E
D
C
G
F
H
Stella Gower

Eragrostis Galpinii, Stent.

A.—Branchlet showing flexous persistent rhachillae. B.—Spikelet. C.—Lower glume. D.—Upper glume. E.—Valve. F.—Pale. G.—Pistil and stamens with lodicules. H.—Grain.

unbranched for from 1–3 cm. from the base, up to 11 cm. long ; *branchlets* spreading, the lowest pair of the lowest branches usually close together sub 2-nate, the upper ones gradually shorter and solitary, less divided and with fewer spikelets and often secund and scabrid ; quite glabrous, without or with few hairs in the axils. *Spikelets* linear, up to 23 mm. long × 2·5 mm. wide, and 10–30-flowered, rachilla at first persistent ; *glumes* subequal, lower 1·5 mm. long, upper 2 mm. long, 1-nerved, minutely scabrid on nerve ; *valves* over 2 mm., purplish, sub-acute, 3-nerved, side nerves long, minutely scabrid all over ; *pale* acute ; rigidly ciliate on the keels, scabrid, nearly equalling the valve, hyaline between the rigidly ciliate keels ; *ovary* oval ; *style* distinct ; *lodicules* truncate. *Stamens* 3 ; *anthers* 1·3 mm. long ; *grain* ovoid, rounded ; embryo small.

Mosdene, Naboomspruit, Waterberg, *Galpin* 456 ; Warmbaths, *Burtt-Davy* 1149 ; near Nylstroom, *Burtt-Davy* 2034 ; Letaba River, Zoutpansberg, *Junod*, *Govt. Herb.*, 4673.

Near to *E. gangetica*, from which it differs in the widely spreading panicle, longer branchlets, and fewer spikelets.

Tristachya pedicellata, Stent.

Gramen perenne, caespitosum, rhizomate obliquo. *Culmi* validi, ad 120 cm. longi, glabri, laeves, 1-3 nodi. *Foliorum vaginae* aliquantum arctae, striatae, glabrae, sed inferiores villosulae ; *laminae* lineares, planae, 15–23 cm. longae, 6–8 mm. latae, glabrae, rigidae, supra asperulae, infra laeves. *Panicula* contracta, nodi inferiores pilosi ; *rami* ad 5 cm. longi, saepe multo minus, superiores saepe nihilo redacti. *Gluma,* inferior, rigide, 3-nervosa, 13 mm. longa, 4 mm. lata, glabra, laeves, ovata, subacuta ; superior, 24 mm. longa, 4·5 mm. lata, apice obtusa. *Valva* inferior, 7-nerva, 20 mm. longa, glabra, obtusa, laevis ; *antherae* 8 mm. longae ; *lodiculae* 1·3 mm. longae, 0·8 mm. latae ; *palea* brevior. *Valva* superior, ad 12 mm. longa, 7–9 nerva, mucrones 2 loborum lateralium breves ; arista media valida, ad 6·5 cm. longa ; *palea* apice acute.

Compactly caespitose on oblique rhizoms. *Culms* stout, up to 120 cm., glabrous, smooth, 1–3-noded, internodes exserted. *Leaf sheaths* somewhat tight, finely ribbed and glabrous, except the lowest, which are loose and finely and appressedly hairy between the ribs ; *blades* linear, tapering to an acute point, 15–23 cm. long × 6–8 mm. wide, glabrous, rigid, flat, scabrid above and on the cartilaginous margins, smooth below. *Panicle* contracted, scanty ; rachis smooth, with oblique, membranous and hairy scales around the lower nodes ; *branches* up to 5 cm. long, often much shorter, the upper so much reduced that the triplets of spikelets appear to be sessile on the rachis. *Pedicels* distinct, 2·4 mm. long. *Lower glume* strongly 3- sub 5-nerved, with a few irregular, oblique, transverse veins, 13 mm. long × 4 mm. wide (flattened out), glabrous, smooth, ovate, subacute ; *upper* 3-nerved, 24 mm. long × 4·5 mm. wide (flattened), narrowing to an obtuse apex, a few irregular oblique veins connecting the nerves in the upper part, glabrous and smooth. *Lower valve* 7-nerved, 3 nerves percurrent, 20 mm. long, glabrous, smooth, obtuse ; *anthers* 8 mm. long ; *lodiculs* 1·3 mm. long × 0·8 mm. broad ; *palea* 14 mm. long, with scabrid keels and bifid tips, lobes acute. Upper floret 12 mm. long, with long-bearded callus 4 mm. ; *valve* 12 mm long, 7- sub 9-nerved in the upper part, hairy, bifid, awned from between the lobes; awn 6·5 cm. ; lobes including short macro 4 mm. ; *palea* with acute scabrid keels, very narrow between the keels, 9 mm. long ; *stamens* 3 ; *style* distinct ; *ovary* trigonous ; *lodicules* lanceolate, 2 mm. long ; *caryops* long, narrow, cylindrical, up to 7 mm. long, grooved on the face ; *embryo* 2 mm. long.

Near to *Tristachya rehmanni*, from which it differs chiefly in the pedicelled spikelets, the short bristles of the upper valve and in the broader leaves.

Waterberg (Transvaal) : Warmbaths, *National Herbarium*, *Burtt-Davy* 1144 ; Naboomspruit, *Galpin* 428.

A FUNGUS OF ECONOMIC IMPORTANCE ON THE AVOCADO

(*Persea Americana*).

By E. M. DOIDGE.

COMPARATIVELY little is known about the fungous diseases to which the Avocado is subject. In Florida it is said to suffer from certain leaf and fruit spot diseases caused by a *Colletotrichum* sp., and the young growth is attacked by a scab fungus said to be identical with *Cladosporium citri*, but none of these fungi is recorded as attacking the twigs and larger limbs.

During 1921 it was reported from Louis Trichardt that certain Avocado trees were in a very bad state, and that spraying with bordeaux mixture had proved quite ineffectual. The twigs which were sent for examination were covered with minute pustules, the fruiting bodies of an ascomycete, and as none of the diseased wood had been excised previous to spraying it was not surprising that the inroads of the fungus had not been checked. As a consequence the trees had become so badly cankered that it was impossible to remove all the diseased bark without seriously affecting the vitality of the trees, and at this stage it was impossible to arrest the progress of the malady.

SYMPTOMS.

The effect of the fungus on the twigs and limbs of the Avocado is very similar to that produced by *Physalospora cydoniae* on the limbs and twigs of apple trees.

In the earlier stages of infection the bark becomes sunken and discoloured; the diseased area increases in size, and gradually girdle the twig or branch, so causing the death of the terminal portion. Branches, 2–3 inches in diameter, are killed in this way, and extensive cankers are produced on the larger limbs and the trunk. The bark of the cankered areas is dark-coloured and sunken, the boundary between the healthy and diseased tissue being marked by a raised, reddish-brown line. As the bark is destroyed it dries out and cracks horizontally, eventually falling away from the wood, which has become dead and discoloured. Numerous fruiting pustules of the pathogen may be observed scattered over the diseased areas of the bark.

The fruits on the diseased trees are affected, showing a corky growth at the lower end, which may possibly be due to the same fungus (but this fact has not been established, as it was not possible to obtain trees in bearing for inoculation purposes). The affected area is irregular in form and varies in size. On fruits examined it was roughly 10 × 5 cm. and 4 × 5 cm. The surface is very much roughened, verona brown (Ridgway) in colour, and deeply cracked, after the fashion of tortoise-shell.

This affection of the fruit is apparently identical with one which occurs in Florida and is mentioned in a paper by H. E. Stevens, published in the "Proceedings of the Florida State Horticultural Society" for 1918. His description is as follows: "Another common type of injury frequently noted on the fruits is referred to as anthracnose by some of the growers. This type of injury is very similar to melanose of citrus fruits in general appearance. It is superficial, and appears in the form of dark reddish-brown, caked masses on the surface of affected fruits. The markings are hard, compact, and the surface is cracked or broken. The injury may cover only a part or the whole surface of the fruit. It makes an unsightly fruit, but apparently does not affect the quality. The disease is apparently caused by a fungus, perhaps a *Gloeosporium* or a closely related species."

MORPHOLOGY.

Perithecia have been found on cankered areas of the twigs of the Avocado pear (*Persea Americana*). They are usually scattered, standing separate from one another. Sometimes, however, they occur in small groups of two to four, and occasionally they have been found so closely crowded as to form a pseudo-stroma, but no true stroma has been observed. They are buried in the cortical tissues, but at maturity the papillate ostiole breaks through to the surface and protrudes slightly.

The form of a typical perithecium is shown in fig. 1, which is a camera-lucida drawing from a medial longitudinal section. The form is subglobose or broadly ellipsoid, 130–190 μ in the horizontal diameter and 100–120 μ in the vertical diameter. The average dimensions are about 170 μ × 100 μ.

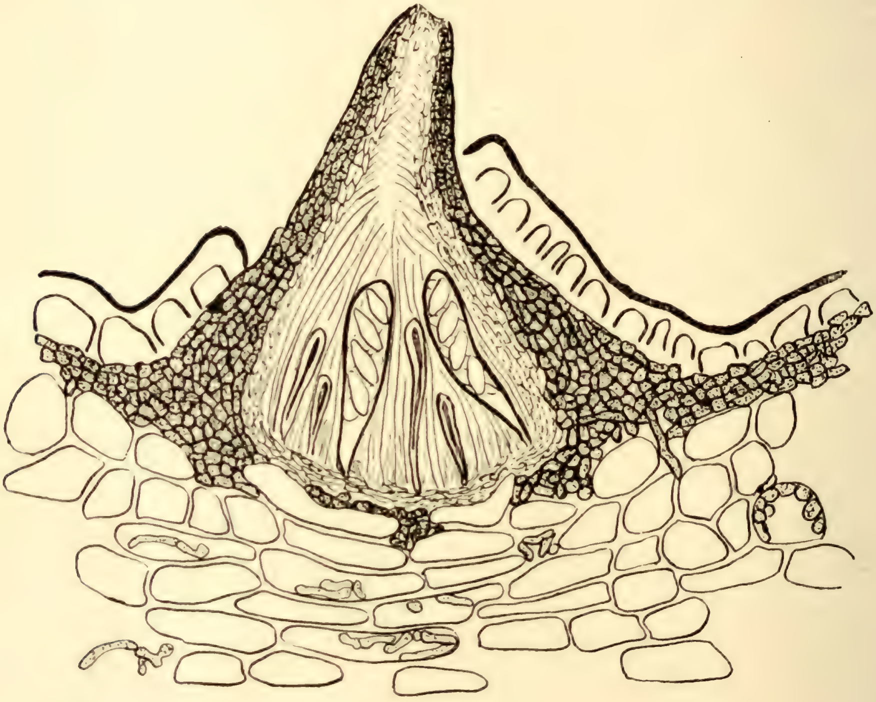


Fig. 1.
Section through a perithecium of *Physalospora perseae*.

The wall is differentiated into two layers: the thickness of the outer layer is variable being thinner or almost absent at the base, and thickest at the sides near the base, where it is 16–24 μ thick. The pseudo-cells are brown, polygonal, 4–5 μ in diameter, or somewhat flattened. Within this there is an inner layer of delicate, colourless, compressed hyphae of much more uniform thickness.

The papilla is usually central, but may be oblique: it is 80–100 μ long and 30–50 μ in diameter, and its walls show two distinct layers similar to those observed in the sides of the perithecium; the ostiole appears in section as a narrow passage between the walls of the papilla. The asci interspersed with paraphyses fill the cavity of the perithecium, and there are numerous thread-like periphyses lining the neck and the inside of the papilla.

The asci are abundant, usually clavate, sometimes tending to the cylindrical or curved, 80–100 μ × 18–23 μ, eight-spored ; they are slightly thickened round the apex, but no canal or apical pore could be observed. The asci do not stain blue with iodine ; they disappear rapidly at maturity, so that one rarely finds an entire ascus containing mature spores ; the wall of the ascus seems to break down as soon as the spores are mature.

The ascospores are more or less distichous, hyaline, ellipsoid or subfusoid, tapering abruptly at each end to a blunt apex, 20–21 μ × 8–10 μ. There are two to three large oil drops in each spore which stain pink with Guéguen's triple stain, the rest of the spore stains a deep blue.

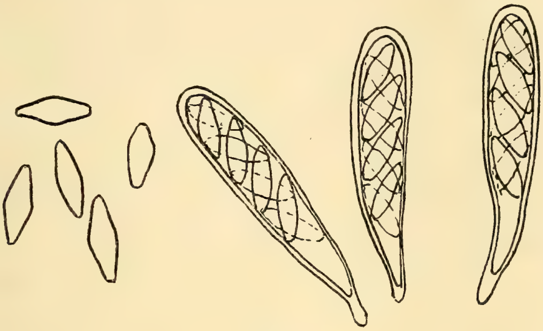


Fig. 2.

Asci and spores of *Physalospora perseae.*

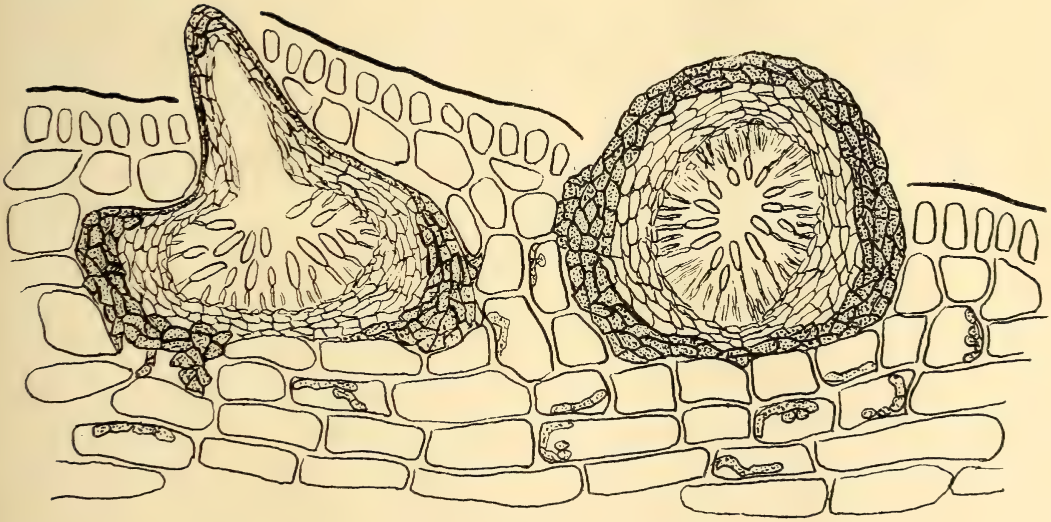


Fig. 3.

Section through two pycnidia.

Pycnidia are found on some of the stem cankers in the place of perithecia or are interspersed with them. The pycnidia are single or in small groups : some are spherical or sub-spherical with a distinct papilla, that is to say, they are similar to the perithecia ; others are conical, spherical or elongated, without a papilla (fig. 3). They are formed under the epidermis or in the cortical tissues, and are erumpent at maturity. The horizontal diameter is 120–130 μ, vertically they measure 70–187 μ, and there is a double wall, the two layers being similar to those described in the perithecia. From the inner wall arises the spore-bearing layer, which occupies almost all the space not taken up by the ostiole. The cells lining the cavity arch inward, and elongate to form a stalk, from the tip of which the pycnospore is abstricted.

The pycnospores are ellipsoid and colourless, and do not turn brown at any time; they are 18–20 μ × 5–6 μ in dimensions.

Physalospora Perseae, nov. sp.

Peritheciis sparsis v. gregariis, tectis, ostiolo papillato erumpente, atris, ellipsoideis v. subglobosis, 130–190 μ × 100–120 μ; ascis clavatis, paraphysatis, 80–100 μ × 18–23 μ, octosporis: paraphysibus filiformibus, numerosis, hyalinis: sporidiis distichis, continuis, hyalinis, ellipsoideis v. subfusiformis utrinque obtusis, 20–21 μ × 8–10 μ. Pycnidiis subglobosis v. ellipsoides, 120–130 μ × 70–187 μ; sporulis hyalinis ellipsoideis, 18–20 μ × 5–6 μ.

Hab. in foliis *Perseae americanae*. Louis Trichardt, Transvaal, 25.4.21, leg. J. H. Cronwright.

When the spores have been discharged from the pycnidia or perithecia, one frequently finds the cavity occupied by another fungus, which is probably a saprophyte or secondary parasite. This organism produces spherical pycnidia about 90 μ in diameter, and filled with small, narrow, ellipsoid, fuliginous, two-celled spores.

The Fungus in Culture.

The fungus was isolated a number of times from diseased twigs by plating (1) ascospores and (2) pycnidia in agar, and (3) from the mycelium present in small pieces of diseased wood. In each case the same fungus was obtained, and the cultural characters were identical. It grows readily on most of the culture media in common use, but as the fruiting bodies develop slowly it was found advisable to use conical flasks rather than petri dishes for culture work, as the latter dried out too rapidly.

Cultures on prune agar, oatmeal agar, and maize-meal agar were kept in the greenhouse in a bright diffused light. The mycelium is at first cottony, but after a few days the submerged hyphae are green or blue-green for some time, after which the growth is dark or nearly black. The outer ends of the aerial hyphae maintain their original cottony appearance and become greyish in colour. Cultures in active growth often show distinct zoning. Thus far the fungus *Physalospora Perseae* closely resembles in its cultural characters *Ph. Cydoniae*, which is parasitic in apple twigs,* but the formation of pycnidia is very different from that observed in cultures of the latter fungus.

The submerged hyphae, as seen by transmitted light, are olive-green or brownish in colour, and are about 3 μ thick; the aerial hyphae are more slender and hyaline. After three or four weeks on oatmeal agar small bodies consisting of tangled masses of hyphae appear on the surface of the culture; these increase in size until they form tussocks, 3–6 mm. in diameter and about 3 mm. in height; these are dark-coloured bodies, but with a thin covering of the cottony aerial mycelium. After about six weeks the top of those bodies becomes covered with hard, black pustules, from which seven to eight weeks old cultures masses of conidia ooze out.

A cross-section through one of the sclerotial bodies first observed in a three weeks old culture shows that it consists of tangled masses of hyphae similar in form to the submerged hyphae of the ordinary mycelium. Later there is a differentiation with a sterile base, consisting of interlaced dark-coloured hyphae, brown or olive-green, by transmitted light, and an upper portion of more closely woven, lighter-coloured hyphae in which a number of cavities are developed. These are irregularly arranged in one or more layers, ellipsoid or flask-shaped—usually papillate, 250–320 μ × 130–200 μ. The inside of the cavity is lined with a layer of compressed hyaline hyphae, which eventually arch inwards and form the conidiophores. The tip of the conidiophore swells up and the mature conidium is cut off.

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* Hesler, L. R.: Black Rot, Leaf Spot, and Canker of Pomaceous Fruits. Cornell Univ. Agric. Exp. Sta. Bull. 379. Aug. 1916.

On maize-meal agar and prune agar slight differences are observed. On maize-meal agar the pycnidial cushions are up to 8 mm. in diameter; on prune agar the form is somewhat different, the pycnidial cushions are columnar, 5–6 mm. high and 3–5 mm. thick. They have a sterile base, which is usually rather smaller in diameter than the rounded head in which the pycnidial cavities are found.

Sugar agar appears to be an unsuitable medium; there is no aerial mycelium, and only a few small sterile sclerotia are formed. Potato agar is also an unfavourable medium. On solution N. agar only a few small sub-spherical cushions are formed, which are 2–3 mm. in diameter, and show some internal differentiation, but none were observed in which mature pycnidial chambers were formed.

The masses of conidia oozing out of the pycnidia are pale orange-yellow (Ridgway). Individual conidia are hyaline, thin-walled, with granular contents, and containing a few oil drops. The majority are ellipsoid in form, a few are sub-fusoid or sub-pyriform; they vary from 16·5–23·5 μ in length and from 6–7·5 μ in breadth, the greater number measuring 18–20 μ × 6·5–6·7 μ.

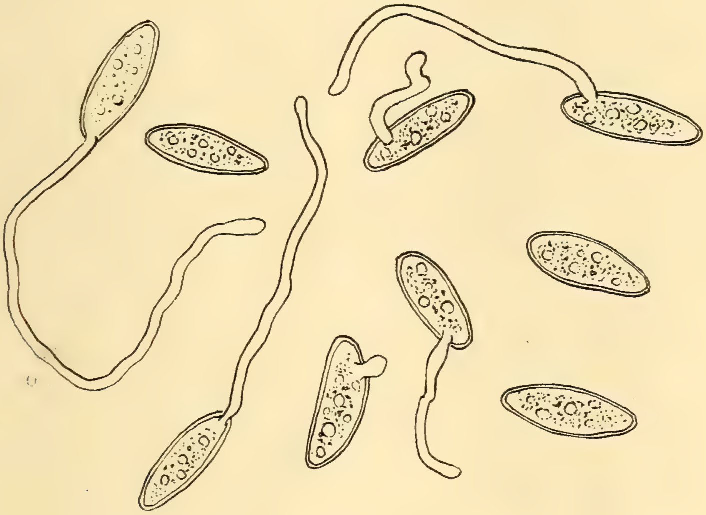


Fig. 4.
Germinating conidia after 6 hours at 25° C. in hanging drop.

A number of hanging drop cultures in Ward tubes, each containing a small number of conidia, were put into an incubator at 25° C. After six hours a considerable number had germinated (fig. 4). The form and character of the spore remained unchanged, and a single germ tube, 2·5–3 μ thick, colourless and non-septate, had been produced at or near one pole.

After twenty-four hours possibly 20 per cent. of the conidia remained unchanged and had not germinated. The remainder had lost their granular appearance and had become slightly broader and more broadly rounded at the ends, the majority being 6·7–7·5 μ broad. They were still quite hyaline, but had become septate: most commonly with 2-transverse septa, but a few were 1-septate, and there was an occasional one which was 3-septate. Those which were germinating had, with a few exceptions, produced two germ tubes, one from each terminal cell (fig. 5).

The conidia, which had germinated in six hours, had developed considerably, and had produced elongated hyphae which were septate and branched.

After forty-two hours there was no further change, except in the increased length of the germ tubes and the increased number of spores with two and three septations. At no time was any suggestion of a change of colour observable in the conidia.

The ascus stage was not found in culture, but, as stated elsewhere, its connection with the conidial stage has been traced.

Inoculation Experiments.

Several seedling Avocados in the greenhouse were inoculated with conidia from cultures on oatmeal agar and with pieces of mycelium. In each case a small incision was made in the bark, the infective material inserted, and the branch at the point of inoculation was kept moist for about forty-eight hours.

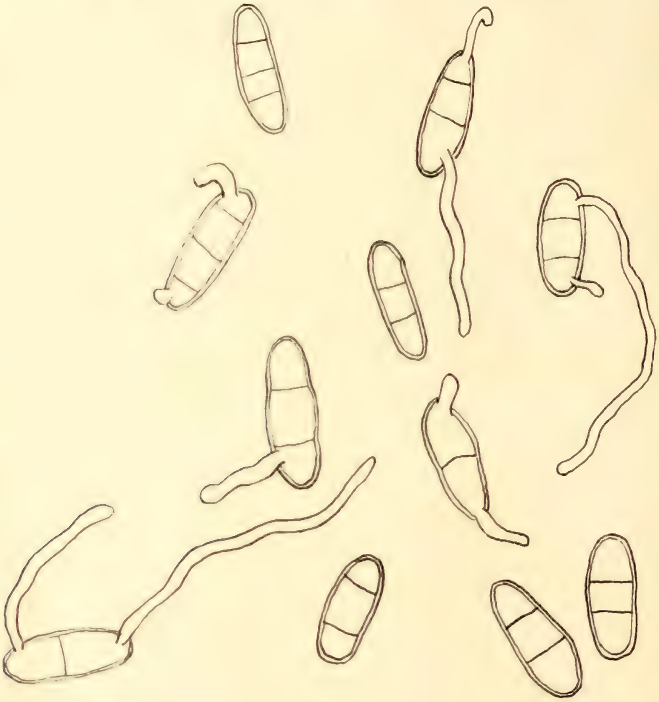


Fig. 5.

Conidia after 24 hours at 25° C.

The plants which were inoculated with conidia soon showed signs of infection. The tissues around the incision became discoloured and sunken; in some cases the affected area slowly increased in size for a few weeks until it was about 1 cm. in diameter, and then its progress was arrested. Two trees became completely girdled, the whole stem was invaded and killed, and after six months typical conidia were produced. The pycnidia and conidia on these artificially infected trees were identical with those found on twigs in the orchard.

PATHOLOGICAL HISTOLOGY.

The fungus appears to be a wound parasite. In the cortical tissues of infected twigs there is a rather coarse brownish mycelium about 3·5 μ thick. The cell walls are discoloured, but there is no very prominent deposit in any of the cells. At certain spots there are masses of densely woven hyphae in the epidermal and hypodermal cells, which rupture the cuticle,

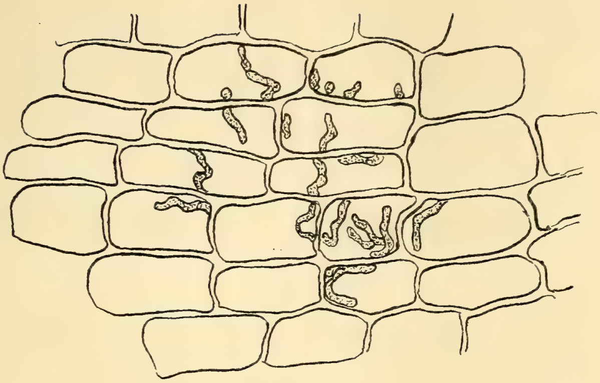


Fig. 6.
Section through twig 6 months after innoculation, showing mycelium in cells of cortex.

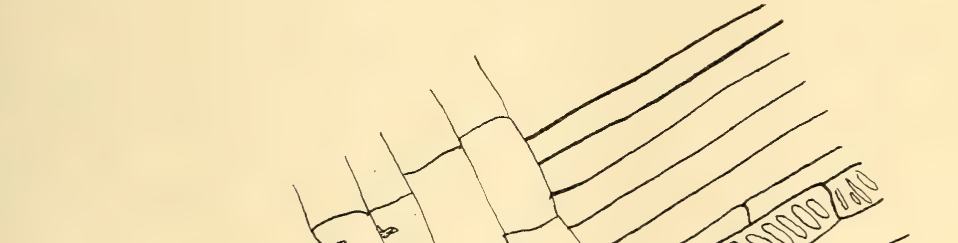


Fig. 7.
Section through xylem region of same twig, showing mycelium confined to cells of medullary rays.

and are the early stages in the development of the pycnidia and perithecia. The mycelium is intracellular, it penetrates through the cortical cells to the cambium, and invades the xylem region, where it is apparently confined to the cells of the medullary rays. In a large number of sections examined no hyphae were observed in the xylem vessels.

PREVENTIVE MEASURES.

In its early stages the disease could probably be arrested by surgical methods and spraying with bordeaux mixture. As in dealing with other cankers all diseased twigs should be removed, cankers on larger limbs excised, and all wounds painted with some disinfectant and protective substance. In its later stages it is difficult and almost impossible to arrest the progress of the disease.

SPECIES OF ELEPHANTORRHIZA IN THE SOUTH AFRICAN HERBARIA.

By E. P. Phillips, M.A., D.Sc., F.L.S.

The genus *Elephantorrhiza* is a small genus belonging to the *Leguminosae*, and was founded by Bentham in 1842 on the common Transvaal plant, *E. Burchellii.* Four years later he described another species also from the Transvaal, *E. Burkei.* Since then Schinz and Harms each described a species found in South Africa, and two years ago Mr. Burtt-Davy described a species from the Transvaal. An examination of the material in the South African Herbaria has brought to light two additional species which hitherto have been confused with *E. Burchellii.*

Two of the seven species found in South Africa have an acaulescent habit, viz., *E. Burchellii* and *E. obliqua.*

The shape and venation of the pinnules differ in all the species, and afford a good character whereby the species may be distinguished. The reader is referred to the accompanying plate illustrating the pinnules of the seven species described.

Elephantorrhiza Burchellii, commonly known as "Eland's Boontjes," is an extremely common plant on the high veld in spring, and in many parts of the Transvaal is the dominant species on veld which has been burnt. It is an acaulescent plant with enormous roots, which extend to a considerable depth into the ground. Young plants have been excavated by the writer with roots which penetrate to a depth of over 6 feet. The roots of this species have been used for tanning, but other plants have now superseded it. Mr. C. Howlett, of the Division of Botany, carried out a series of dyeing experiments with a 30 per cent. solution of the roots. Wool was treated with a 1 per cent. of the following mordants, and gave the following results (the colours mentioned are those of Ridgway's Colour Standards and Nomenclature) :—

1.	Ammonium molybdate	Orange rufous. (Plate II.)
2.	Ammonium vanadate	Plumbeous black. (Plate LII.)
3.	Chromium chloride	Naphthalene yellow. (Plate XVI.)
4.	Ferrous sulphate	Quaker drab. (Plate LI.)
5.	Nickel sulphate	Salmon colour. (Plate XIV.)
6.	Stannous chloride	Empire yellow. (Plate IV.)
7.	Sodium tungstate	Salmon colour. (Plate XLV.)
8.	Uranium nitrate	Rufous. (Plate XIV.)
9.	Zinc sulphate	Salmon colour. (Plate XIV.)
10.	Cobalt acetate	Bittersweet pink. (Plate II.)

The above colours are, however, not permanent, and since these experiments were conducted some three years ago some of the colours in the samples of wool have changed.

The seeds of this species show an interesting and uncommon type of germination, which has been described by Miss J. Hofmeyr in the "South African Journal of Natural History," Vol. III, No. 1.

The writer is indebted to the Curators of the various Herbaria for lending him the material in their respective collections, and to Mr. J. Hutchinson, F.L.S., of the Kew Herbarium, for comparing some of the specimens with material in the Kew and British Museum Herbaria.

Plate V.

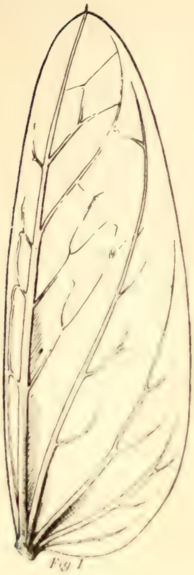


Fig 1

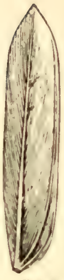


Fig 2

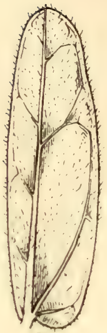


Fig 3

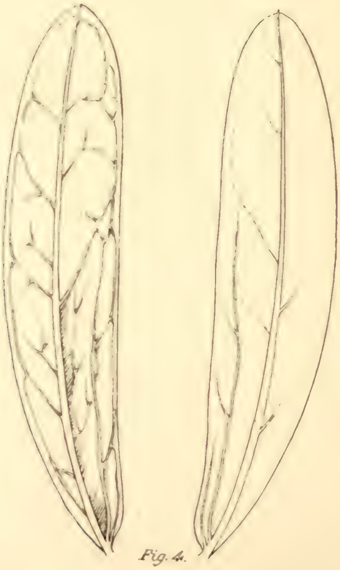


Fig. 4.

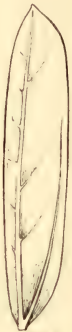


Fig 5

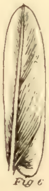


Fig 6

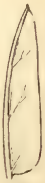


Fig. 7.

Del. Stella Gower.

Fig. 1.—*E. obliqua*, Benth., Davy. var *Glabra*, Phill.

Fig. 2.—*E. Burchellii*, Benth.

Fig. 3.—*E. pubescens.* Phill.

Fig. 4.—*E. Burkei*, Benth.

Fig. 5.—*E. rangeri* Phill.

Fig. 6.—*E. Woodii.* Phill.

Fig. 7.—*E. suffruticosa*, Schinz.

KEY TO SPECIES.

- Acaulescent plants with leaves and inflorescence arising from large and thickened root-stocks.
  - Pinnules ovate, prominently oblique at the base.................. 1. *obliqua.*
  - Pinnules linear, not or scarcely oblique at the base............ 2. *Burchellii.*
- Shrubs or small trees with a distinct aerial stem.
  - Branches pubescent.
    - Inflorescence about 1 cm. in diameter; calyx lobes acute, as long as the tube; pinnules glabrous........................... *Woodii* var. *pubescens*
    - Inflorescence about 7 mm. in diameter; calyx lobes obtuse, half as long as the tube; pinnules pubescent.................. 3. *pubescens.*
  - Branches glabrous.
    - Midrib more or less in the middle of the pinnule; pinnules equal at the base.. 4. *Burkei.*
    - Midrib approaching one margin of the pinnule; pinnules oblique or manifestly unequal at the base.
      - Pinnules with a distinct lateral vein from the base and parallel with the margin.......................... 5. *Rangeri.*
      - Pinnules with a midrib only.
        - Leaves 5–10-jugate; branches fluted.............. 6. *Woodii.*
        - Leaves about 20-jugate; branches not fluted...... 7. *suffruticosa.*

1. **E. obliqua,** Burtt-Davy, in "Kew Bulletin" (1920).

An acaulescent plant. *Stem* pubescent. *Leaves* bipinnate, 9–20 cm. long, 4-6 jugate; petiole and rachis pubescent; pinnae 3–8 cm. long; pinnules 0·6–1·5 cm. long, 2–6 mm. broad, ovate, very distinctly mucronate at the apex, very unequal at the base, glabrous, with the midrib prominent beneath, approaching one margin of the pinnule and excurrent into the mucro; lateral veins faint. *Inflorescence* axillary, 4–6 mm. long, cylindric. *Flowers* pedicelled. *Pedicels* about 1 mm. long, glabrous, articulated at the middle. *Calyx-tube* 0·75–1·5 mm. long, campanulate, glabrous; lobes 0·5 mm. long or less, ovate, obtuse, or subacute (sometimes one lobe minutely apiculate). *Petals* sometimes slightly connate at the base, 3·5–4 mm. long, 1 mm. broad, oblong-linear, cucullate, and with an inflexed mucro at the apex, glabrous. *Filaments* connate at the base, 6 mm. long, linear, glabrous; anthers 1 mm. long, elliptic, with a caducous stalked gland at the apex. *Ovary* sessile, 5 mm. long, linear in outline, glabrous; style 7 mm. long, cylindric; stigma simple, opening by an apical pore. *Fruit* not seen.

Transvaal.—Wakkerstroom District: Volksrust, *Jenkins in Herb. Transvaal Mus.* 9296.

Var. **glabra,** Phillips (Pl. V, fig. 1; Pl. VI).

Differs from the type in being perfectly glabrous and in the veining of the pinnules being very distinct.

Transvaal.—Middelburg District: Middelburg, *Jenkins in Herb. Transvaal Mus.* 9128; Botsabelo, *Eiselen in National Herb.* 1229.

2. **E. Burchellii,** Bth., in Hook. "Journ. Bot.," IV (1842) 344 (Pl. V, fig. 2; Pl. VI).

An acaulescent plant. *Stem* glabrous. *Leaves* bipinnate, 5·5–22 cm. long, 5–13-jugate; petiole and rachis glabrous; pinnae 2·5–11 cm. long; pinnules 0·3–1·4 cm. long, 0·25–2 mm. broad, subulate, linear to linear-oblong, acute, slightly narrowed and equal at the base, glabrous, with the midrib distinct and approaching one margin of the leaf. *Inflorescence* arising from the woody portion of stem, also axillary, 4–11 mm. long, cylindric. *Flowers* pedicelled. *Pedicels* 0·5–1·5 mm. long, usually articulated at the base, sometimes at the middle. *Calyx-tube* 0·75–1·25 mm. long, campanulate, glabrous; lobes 0·5–1 mm. long, ovate, acute or obtuse. *Petals* free or slightly connate at the base, 3–4 mm. long, 1 mm. broad, oblong or oblong-lanceolate, acute or subacute, sometimes cucullate at the apex, glabrous. *Filaments* connate at the base, 5·5–6·5 mm. long, linear, glabrous; anthers 0·75–1 mm. long, suborbicular or elliptic, with a caducous stalked gland at the apex. *Ovary* sessile, 3 mm. long, linear in outline, glabrous; style 4–5 mm. long, cylindric; stigma simple, opening by a terminal pore. *Fruit* 8–20·5 cm. long, 2·6–3·8 cm. broad; valves flat or convex.—*Harv. in "Fl. Cap.," II*, 277.

South Africa.—Without precise locality, *Mrs. Barber* 55 ; *Zeyher* 127.

Cape Province.—Queenstown District : Zwatkei, December, *E. & Z.* 1693 ; near Mission Station at Shiloh, 2000 ft., December, *Baur* 379, and in *Herb. Norm. Austro-Afric.* 964 ; plains round Queenstown, 3600 ft., October, *Galpin* 1917. Kimberley District : Kimberley, *Marloth* 852.

Basutoland.—Leribe District : Near Mission Station at Leribe, *Mrs. Dieterlen* 46, and in *Herb. Musei Austro-Afric.* 7256.

Orange Free State.—Ladybrand District : Ladybrand, November, *Rogers in Herb. Transvaal Mus.* 5057 ; between Senekal and Bethlehem, c. 5000 ft., December, *Flanagan* 1903. Harrismith District : Bester's Vlei, near Harrismith, 5500 ft., December, *Bolus* 8157. Bethlehem District : Bethlehem, *Phillips* 3186. Bloemfontein District : P.O. De Burg, Bloemfontein, February, *Cyrus in Govt. Herb.* 8794. Thabanchu District : Caledon and Vaal Rivers, December, *Zeyher* : Pniel, Vaal River, 4000–5000 ft., November, *Bolus* 2075.

Transvaal.—Potchefstroom District : Potchefstroom, May, *Burtt-Davy in Govt. Herb.* 52. Heidelberg District : Vereeniging, September, *Leslie in Herb. Transvaal Mus.* 5673 ; Heidelberg, November, *Miss Leendertz in Herb. Transvaal Mus.* 8094. Bloemhof District : "Kaffraria," Christiana, March, *Native Aaron in Govt. Herb.* 14432. Marico District : Zeerust, January, *Miss Leendertz in Herb. Transvaal Mus.* 11433. Witwatersrand District : Jeppestown Ridge, Johannesburg, c. 6000 ft., October, *Gilfillan* 44A, and in *Herb. Galpin* 6006 ; Florida, near Johannesburg, December, *Mrs. Hutton* 621. Pretoria District : Groenkloof, near Pretoria, *Phillips* 3051 ; Pretoria Kopjes, October, *Miss Leendertz* 341, and in *Herb. Transvaal Mus.* 8428, and in *Herb. Austro-Afric.* 1077, October, *Burtt-Davy* 2294 ; Gezina, near Pretoria, November, *Miss Leendertz* 434, and in *Herb. Transvaal Mus.* 8429. Rustenburg District : Rustenburg, 4500 ft., *Miss Nation* 225 ; Beestkraal, December, *Jenkins in Herb. Transvaal Mus.* 6963. Waterberg District : Near Nylstroom, November, *Burtt-Davy* 2017 : Springbok Flats, 3000 ft., October, *Burtt-Davy in Govt. Herb.* 7066 ; Pietpotgietersrust, October, *Miss Leendertz in Herb. Transvaal Mus.* 7383 ; Moorddrift, October, *Miss Leendertz in Herb. Transvaal Mus.* 7364. Wakkerstroom District : Mooifontein, 5500 ft., October, *Schlechter* 3567, and in *Herb. Transvaal Mus.* 5399. Barberton District : Hillsides at Barberton, 2300–2800 ft., September-October, *Galpin* 562 ; Barberton, November, *Miss Williams in Herb. Transvaal Mus.* 7637, 3000 ft., December, *Thorncroft*, 666, and in *Natal Herb.* 15089.

Swaziland.—Without precise locality, *Miss Stewart in Herb. Transvaal Mus.* 8857. Batlapin County : Without precise locality, *Nelson in Herb. Transvaal Mus.* 11740.

Kalahari.—Without precise locality, *Schinz.* 276. Vryburg District : Armoed's Vlakte, November, *Burtt-Davy in Govt. Herb.* 10963.

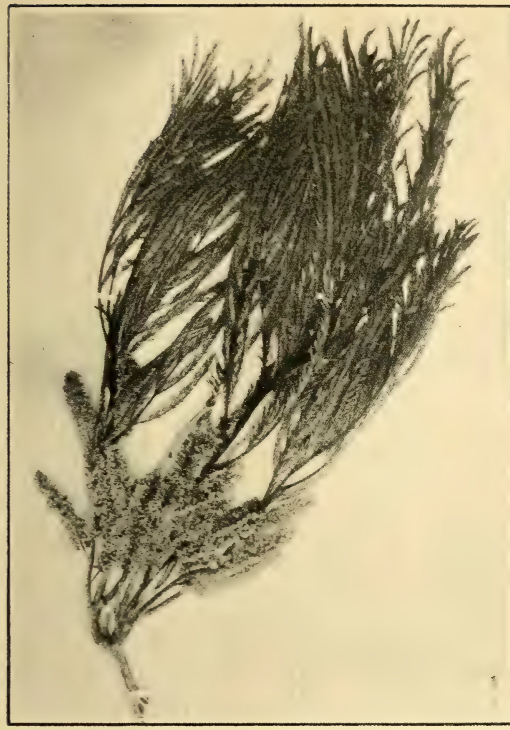
Natal.—Mount Moreland, 500 ft., May, Wood 2607 ; Nonoti, 100–200 ft., October, *Natal Herb.* 14202.

3. **E. pubescens,** Phillips, sp. nov. (Pl. V, fig. 3).

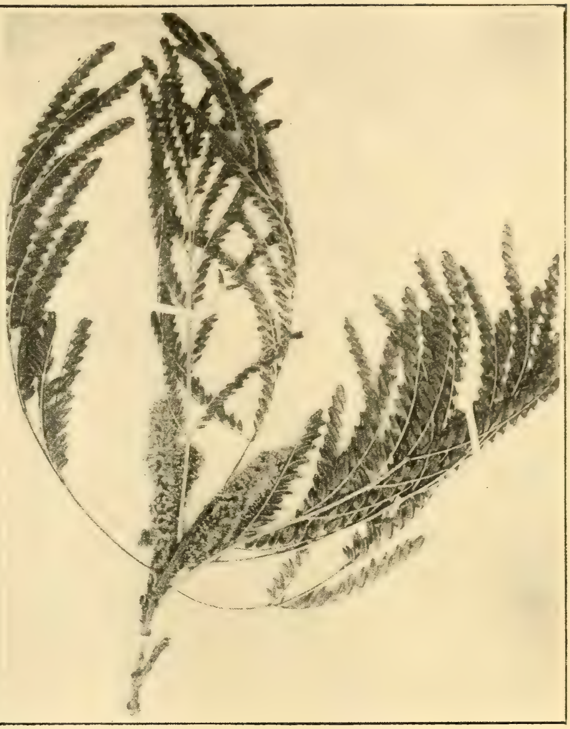
Rami pubescentes. *Folia* 2–10-jugate : foliola 5–8·5 mm. longa, 1 mm. lata, oblongo-linearia, apice mucronata, basi obliqua, pubescentia. *Inflorescentia* 7 cm. longa, 7 mm. lata, cylindrica. *Pedicellus* 0·5 mm. longus, glaber. *Tubus calyci* 0·5 mm. longus, campanulatus ; lobi 0·25 mm. longi, ovati, apice obtusi.

Rhodesia.—Six miles below Kafue Bridge, *Rogers* 8659.

Branches striate, pubescent. *Leaves* bipinnate, 4–17 cm. long, 2–10-jugate ; petiole and rachis pubescent ; pinnae 5–7 cm. long ; pinnules 5–8·5 mm. long, 1 mm. broad, oblong-linear, shortly mucronate, unequal at the base, pubescent more especially on the under surface, with the midrib distinct and approaching one margin of the pinnule. *Inflorescence* axillary, 7 cm. long, about 7 mm. in diameter, narrowly cylindric. *Flowers*



Elephantorrhiza Burchellii, Benth.



Elephantorrhiza obliqua, Burtt-Davy,
var. *glabra*, Phillips.

Photo] [*E. P. Phillips.*

Field of *Elephantorrhiza Burchellii*, Benth., at
Groenkloof, near Pretoria.

pedicelled. *Pedicels* 0·5 mm. long, glabrous. *Calyx-tube* 0·5 mm. long, campanulate, glabrous ; lobes 0·25 mm. long, ovate, obtuse, not ribbed. *Corolla*, with a tube, 0·5 mm. long ; lobes 2 mm. long, 0·75 mm. broad, oblong, obtuse, slightly inflexed at the apex. *Filaments* connate at the base, 3·5 mm. long, linear, acute at the apex, glabrous ; anthers scarcely 0·5 mm. long, subglobose, with a minute caducous gland at the apex. *Ovary* shortly stalked, 1·5 mm. long, linear in outline, glabrous ; style 2 mm. long, cylindric ; stigma simple.

This species is readily distinguished from the former by the pubescent pinnules and the short, rounded calyx lobes, which are only half as long as the calyx-tube.

4. **E. Burkei,** Benth., in Hook., “ Journ. Bot.,” V (1846) 81 (Pl. V, fig. 4).

A branched shrub 3–5 ft. high, or small tree 8–10 ft. high. *Stem* and branches glabrous. *Leaves* bipinnate, 7–23 cm. long, 4–6-jugate ; petiole and rachis glabrous ; pinnae 3–10 cm. long ; pinnules 0·7–1·6 cm. long, 1–3 mm. broad, oblong or linear-oblong, obtuse, or shortly and bluntly mucronate at the apex, sometimes emarginate, slightly narrowed and equal at the base, with the midrib distinct beneath and situated in the middle of the pinnule. *Inflorescence* axillary, 5–10 cm. long, cylindric. *Flowers* pedicelled ; pedicels 0·75–2 mm. long, articulated at the middle, more rarely at the base. *Calyx-tube* 1–1·5 mm. long, campanulate, glabrous ; lobes 0·5–1 mm. long, ovate, subacute or obtuse, usually (rarely without) with very minute but distinct projections in the sinuses or on the margins of the lobes. *Petals* 2·5–4 mm. long, 1·25–1·5 mm. broad, lanceolate, elliptic-lanceolate or elliptic, cucullate and inflexed at the apex, glabrous. *Filaments* connate at the base, 4–6·5 mm. long, linear, glabrous ; anthers 0·75–1 mm. long, elliptic or almost quadrate in outline, with a stalked caducous gland at the apex. *Ovary* sessile, 2–3 mm. long, linear in outline, glabrous ; style 2·5–4 mm. long, cylindric ; stigma simple, opening by a terminal pore. *Fruit* 7–21 cm. long, 2·8–3·5 cm. broad ; valves flat.—*Harv. in* “ *Fl. Cap.*,” *II*, 279 ; *E. rubescens*, *Gibbs in* “ *Journ. Linn. Soc. Bot.*, *XXXVI*, 441 (1906).

SOUTH AFRICA.—Without locality (probably Portuguese East Africa), *Junod* 435. Transvaal. Pretoria District : Kopjes aboat six miles east of Pretoria, *Phillips* 3040 ; Wonderboom Poort, near Pretoria, October, *Miss Leendertz* 314, and in *Herb. Transvaal Mus.* 8430 ; near the “ Wonderboom,” December, *Burtt-Davy* 2663. *Miss Leendertz* 433, and in *Herb. Transvaal Mus.* 8431 ; Magaliesburg, October, *Zeyher* 560, 321. Waterberg District : Warmbaths, January, *Bolus* 11862 ; Pietpotgietersrust, September-January, *Miss Leendertz in Herb. Transvaal Mus.* 4757, 5581. Bechuanaland.—Mafeking, *Appleyard.*

RHODESIA.—South Rhodesia : Matlopo Hills, 4500 ft., September, *Rogers* 5335, *Galpin* 7081 ; Zambesi Gorge, 2900 ft., September, *Galpin* 7062.

5. **E. Rangeri,** Harms, in Engl., “ Bot. Jahrb.,” XLIX, 420 (1913) (Pl. V, fig. 5).

A shrub 4 m. (?) high. *Branches* glabrous. *Leaves* bipinnate, 10–19 cm. long, 5–7-jugate ; petiole and rachis glabrous ; pinnae 3–6·5 cm. long ; pinnules 4–9 mm. long, 0·5–1·75 cm. broad, linear-oblong, shortly and bluntly mucronate, somewhat narrowed at the base and hardly unequal, with the midrib distinct approaching one margin, and a lateral vein arising from the base and approaching the opposite margin, glabrous. *Inflorescence* axillary, 5·5–6·5 cm. long, cylindric. *Flowers* pedicelled. *Pedicels* 0·75 mm. long, articulated at the base. *Calyx-tube* 1 mm. long, campanulate, glabrous ; lobes 0·5 mm. long, broad, oblong-lanceolate, obtuse or subacute, glabrous. *Filaments* connate at the base, 5 mm. long, linear, glabrous ; anthers 0·75 mm. long, almost quadrate in outline, with a caducous stalked gland at the apex. *Ovary* sessile, 2 mm. long, linear in outline, glabrous ; style 2·5 mm. long, cylindric ; stigma simple, opening by a terminal pore. *Fruit* not seen.

SOUTH-WEST AFRICA.—Hohearte (?), December, *Dinter* 2264, and in *Herb. Muses. Austro-Afric.* 4485.

6. **E. Woodii,** Phillips, sp. nov. (Pl. V, fig. 6.)

Rami glabri, striati. *Folia* 5–10-jugata ; foliola 2·5–4 mm. longa, 1 mm. lata, oblongo-linearia, apice acuta, mucronata, base obliqua, glabra. *Inflorescentia* 8·5–11 cm. longa, cylindrica. *Tubus calyci* 0·75–1·25 mm. longus, campanulatus, glaber ; lobi 0·25–5 mm. longi, ovati, apice acuti.

NATAL.—Weenen County : Pieters, near Colenso, 3000–4000 ft., *Wood* 7958, and in *Natal-Govt. Herb.* 8768.

Branches glabrous, fluted. *Leaves* bipinnate, 6–15 cm. long, 5–10-jugate ; petiole and rachis glabrous ; pinnae 1·8–6 cm. long ; pinnules 2·5–4 mm. long, 1 mm. broad, oblong-linear, acute, mucronate, very unequal-sided at the base, with the midrib indistinct or evident and then approaching one margin of the leaf, glabrous. *Inflorescence* axillary, 8·5–11 cm. long, cylindric. *Flowers* pedicelled. *Pedicels* 1·25–1·5 mm. long, articulated at the base. *Calyx-tube* 0·75–1·25 mm. long, campanulate, glabrous ; lobes 0·25–5 mm. long, ovate, acute. *Petals* slightly connate at the base, 3·5–4·5 mm. long, 1·25 mm. broad, lanceolate, acute. *Filaments* connate at the base, 3·5–5 mm. long, cylindric, glabrous ; anthers 1 mm. long, elliptic, with a caducous stalked gland at the apex. *Ovary* sessile, 2·5 mm. long, linear in outline ; style 4·5–5·5 mm. long, cylindric, glabrous ; stigma simple, opening by a terminal pore. *Fruit* (only one seen), 9 cm. long, 3·2 cm. broad, subfalcate ; valves flat.

Var. **pubescens,** Phillips.

Rami pubescentes.

NATAL.—Near Little Tugela, *Wood* 2867.

This differs from the species in the pubescent branches and in being sparsely pubescent on the petiole and rachis. The calyx-lobes have a distinct rib and are membranous between the ribs. The variety and the species require further examination when further material comes to hand, as it is probable that the former may be raised to specific rank.

E. suffruticosa, Schinz., in "Mem. Herb. Boiss.," No. 1, 117 (Pl. V, fig. 7).

A bush 2–4 m. high. *Branches* smooth, glabrous, with dark bark. *Leaves* bipinnate, 16–24 cm. long, about 20-jugate ; petiole and rachis glabrous ; pinnae 2–7 mm. long ; pinnules 3–5·5 mm. broad, linear, acute or subacute, manifestly unequal-sided at the base, with a distinct midrib approaching one margin of the pinnule, glabrous. *Inflorescence* up to 10 cm. long, cylindric. *Flowers* pedicelled. *Pedicels* 0·25–0·75 mm. long, articulated at the base or apex. *Calyx-tube* 1 mm. long, campanulate, glabrous ; lobes 0·5 mm. long, ovate, obtuse. *Petals* 3 mm. long, 1 mm. broad, lanceolate, acute or subacute. *Filaments* connate at the base, 5 mm. long, cylindric, glabrous ; anthers 0·75–1 mm. long, elliptic, with a stalked caducous gland at the apex. *Ovary* sessile, 2·5 mm. long, linear in outline, glabrous ; style 2·5–3·5 mm. long, cylindric, glabrous ; stigma simple opening by an apical gland. *Fruit* 8–26 cm. long, 1·7–2·5 cm. broad, linear, very rarely oblong, valves flat.

RHODESIA.—Umtali District : Odanzi River Valley, *Teague* 291.

SOUTH-WEST AFRICA.—Okahandja, 1300 m., November, *Dinter* 314, February, *Dinter*, 2781 ; Bull's Mouth Pass on steep slopes, bush 10–15 ft. high, December, *Pearson in Percy Sladen Memorial Exped.* 8919, and in *Herb. Musei Austro-Afric.* 11972 ; Awas Mountains, Pass between Haris and Aub, January, *Pearson in Percy Sladen Memorial Exped.* 9658.

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